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### STANDARDIZED AND PROGRESSIVE SURGERY.<sup>1</sup>

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THE present day tendency in America to do most things in a big way necessitates and develops a high degree of efficiency. Standardization of methods has been extended to medicine and surgery. So many patients go through the big surgical clinics that unless good, immediate and to a lesser extent remote results were obtained, the clinic would soon cease to exist. Methods of treatment are continued only on their results, so that fanciful, theoretical or unpractical operations, the results of which are dubious, are very quickly eliminated in favour of standard and well-tried procedures. On the other hand in the big teaching schools daring and progressive surgery is originated and practised. I am in hopes that observations along these lines might be interesting to the members.

Great medical centres differ. On the one hand there are the big surgical clinics like that of the

Mayo brothers and Crile, in which most of the patients are private and in which magnificent surgical research is combined with the most perfect system of hospital treatment for private patients that money can devise, while on the other hand the big centres of university teaching, Boston, Harvard, Yale, Philadelphia, Baltimore and St. Louis, are laying down medical history by their scientific attitude in teaching and their progressive and revolutionary methods. Cushing, who has trained several professors of surgery in a very few years, is inclined to think that the effect of over-specialization must be combated. For this reason all kinds of patients are found in his ward; the neurological, the urological, the gynaecological and the general surgical patients lie side by side and they occur to the student as he would meet them in medical practice. Also with a similar object routine ward visits are arranged with the different clinics; teachers, assistants and students visit the different departments, perhaps the X-ray clinic one morning, the orthopaedic clinic another and so on.

The hospital staff meeting originated by the American College of Surgeons has been a valuable feature in hospital life. In the main it aims at a conscientious analysis by the staff of the deaths which have occurred in the hospital for the month. To this sometimes is added a consideration of the

<sup>1</sup> Read at a meeting of the Victorian Branch of the British Medical Association on April 1, 1925.

results of treatment and a discussion on the errors in diagnosis. These meetings have done much to stimulate clinical enthusiasm and to develop a surgical conscience. I visited many small hospitals in which the mortality from operations was very high before the staff meeting was inaugurated; they have gradually developed into first-class hospitals with excellent surgical results under the gentle stimulus of the invariably charitable and always kindly criticism of its own staff, practically working as a big team. We in Australia complain that our conditions are not suitable for team work, but what better environment is there for this than our public hospitals?

The structure, arrangements, aseptic technique and lighting of the American operating theatres leave nothing to be desired. Visitors although they occupied the gallery, were masked as well as the anaesthetist, assistant and surgeon, probably to prevent talking as much as to avoid any sepsis that might result from it. The more modern theatres are finished in battleship grey, the floors and often the side walls of the theatres being paved with thick rubber squares. The surgeon, his assistants and even the patient are robed in grey, this background it is thought affording the retina the best perception of the details of the wound. There are many systems of artificial lighting. Some theatres are lighted by a system of mirrors, the lights being shielded by a special kind of glass which absorbs heat. In other instances a system of lights focussed on the same spot produces an operation field which is devoid of shadow.

Knives are boiled in liquid paraffin in order to keep the edges and because experience has shown that sterilization in alcohol for thirty minutes fails to destroy the gas bacillus.

Most of the theatres were magnificently equipped for teaching. Frequently the surgeon before commencing to operate charged a lantern fitted with a magazine attachment with slides which would illustrate his operation. During the operation it was necessary for him merely to touch a switch with his foot to illustrate each step or project a large picture of a microscopic slide on the screen. Some theatres were an annex to a large lecture room from which they were separated by a door or screen.

The roofs of hospitals on which are erected large sun rooms, are used for the convalescence of patients, while the basement with a food lift arising from it is utilized for a kitchen. What might be one large ward is subdivided into three small wards by glass partitions, so that the sister can oversee these rooms. Thus, without involving extra nursing attention, are the very bad patients separated from their more fortunate neighbours.

#### Surgical Research.

Every surgical clinic has attached to it a large research department often with a professor of surgical research in charge. One of the most interesting, most practical, most lavishly equipped, magnificently staffed and possibly most ideally situated

was the Experimental Farm of the Mayo Clinic. The farm is situated about four miles from the town and is in charge of Dr. Mann, who has a very high reputation in the world of research. The men who are going through their fellowship in the Mayo clinic, a three years' course of great value open to any English speaking medical graduate, must serve a certain amount of time in this institution. Naturally I was interested in the research work on the stomach. Recently Dr. Mann has continued the experiments of diverting the duodenal contents which he began a few years ago. He is now able to produce chronic ulcer in fifteen out of sixteen laboratory animals by eliminating the effect of the duodenal alkalinity and regurgitation by diversion of the contents of this viscus into the ileum. The ulcer thus produced is apparently chronic from the onset and is indistinguishable microscopically or macroscopically from the chronic ulcer of the human being. Reconstitution of the alimentary canal cures the ulcer at once. It, therefore, appears obvious in these experiments that uncontrolled acidity may be an essential cause of chronic ulcer, but Mann considers that there is also some mechanical factor.

The lesson that we as clinicians may learn from this is that it corresponds to many of our operation failures in which a somewhat similar condition occurs. For instance, after certain gastro-enterostomies in which the acid content is higher than before, probably because of some kink or twist or after certain "Y" operations, where the duodenal contents are purposely diverted from the gastro-enterostomy stoma or after the long loop gastro-enterostomy, the ulcer is more likely to recur or jejunal ulcer originate. It is possible that these experimental ulcers are chronic from the beginning. On the other hand, Rosenow whose work you all know, is producing ulcers along infective and toxic lines and this is apparently a different type of ulcer. Probably it is first acute and then may develop into a chronic process along the lines suggested by Bolton, but in this type of experiment it is extremely difficult to evolve a chronic ulcer; it heals extraordinarily rapidly. It looks, therefore, as if there are two different types of chronic ulcer or at least as if it could be caused in two very different ways: (i.) From the high acidity in which case the ulcer is probably chronic from the beginning and acid is an influential factor; (ii.) from mild infection and perhaps low acidity in which type the ulcer is acute from the first and becomes chronic from secondary infection and other factors.

Vaughan and Dragedst, of Chicago, have shown that any tissue, such as that of the kidney or spleen, sutured into the walls of the stomach is not digested if it has a good circulation. The stomach, therefore, has no specific natural immunity to autodigestion any more than any other normal tissue of the body, yet in Mann's experiments ulcers must have been caused by the unrestrained action of acid. Acid in concentration or over a long period has been shown by many

observers to be a protoplasmic poison. What protective mechanism has broken down in these experiments? Obviously it must be the loss of the duodenal alkaline secretion, as its restoration invariably cures the ulcer. English observers, Bolton, Goodhart, as well as Apperly in our own country, have shown that the concentration of the acid in the stomach depends on the extent of the duodenal alkaline regurgitation and that hypersecretion is rare. What factor then determines the amount or extent of duodenal regurgitation? It is in relation to this and other obscure conditions of the alimentary canal that the late Professor Hunter's conception of a retention posture imposed on the different sections of the alimentary canal by a continuously acting sympathetic nervous supply is so illuminating. This posture which is found to be very unstable and is controlled by the very labile sympathetic system, may be much exaggerated or disturbed by some modern uncivilized methods of life and if not well established may be easily overcome by an excitable parasympathetic system. It is in this way that either the duodenum or the stomach may be exposed to the eroding action of acidity. Infection must be a much more influential cause in gastric ulcer associated, as it generally is, with an exaggerated retention posture and consequent low acidity than in duodenal ulcer. Furthermore, the stagnation of food and low acidity constitute an ideal set of circumstances to nurture infection. High acidity alone is probably the cause of most duodenal ulcers. It is also feasible that a disturbance of retention posture caused by an incoordination between the complementary sections of the involuntary nervous system, much the same as can occur in the extensors and flexors of the voluntary nervous system, is the basis of much of the painless and painful dyspepsia that we see in men, but more frequently in women. As the failures of the numerous surgical attempts to cure this form of dyspepsia by removal of an extrinsic gastric disease, such as chronic appendicitis or chronic cholecystitis, accrue, American surgeons are coming to the conclusion that more often than not this troublesome malady has its origin in the stomach itself. The fact that patients frequently get better for only three or six months probably from the hospital treatment associated with the operation, suggests that the dyspepsia should be attributed to a nervous influence and that indiscriminate cholecystectomy and appendicectomy cannot be practised with advantage to the patient and credit to the surgeon.

It is also possible in the light of the experimental work previously mentioned that these disturbances of retention posture with consequent variation of acid concentration and prolonged exposure to its action may constitute a preulcer condition. This would be compatible with the greater prevalence of gastric diseases in our present civilized age with its unnatural strain on our liberation of energy mechanism.

There is a growing tendency among surgeons in different parts of the world to perform operations

for this painful dyspepsia on stomach itself, such as division of *sphincter pyloricus*, pyloroplasty or even gastrectomy, but so far without much success.

#### Surgery of Gastric Ulcer.

In the Mayo clinic simple gastro-enterostomy for gastric ulcer was rare and restricted to cases of prepyloric ulcer with associated scarring. Some form of partial gastrectomy was the routine or the resection of the ulcer was combined with a gastro-enterostomy. This seems to give in their conscientiously made reports the best result to the patient.

#### Surgery of Duodenal Ulcer.

Balfour does not seem to favour his cauterization method of treating duodenal ulcer so much as in the past; in bad cases he performed a gastrectomy, although he admitted that he did not like doing so. Very often I saw him do a gastro-enterostomy only and the statistics of the Mayo clinic show that they get 80% of cures with this operation. On the other hand C. Mayo was very fond of plastic operations on the pylorus and duodenum. He makes an incision in the stomach and duodenum as in the "Finney" operation, but stitches the mucous membrane and muscle coats like a pyloroplasty. This avoids the spur of a "Finney" operation and gives good results. It has the advantage that if the ulcer is in a suitable position, it may be very readily removed. Judd does a somewhat similar operation, but both he and Mayo admit that there are only certain types of duodenal ulcer that lend themselves to this procedure. For those very old ulcers of the posterior wall the only operation was that of partial gastrectomy and when I suggested to Dr. Balfour the operation of partial gastric exclusion for this condition, he very readily accepted the suggestion and after performing the operation expressed himself as well pleased with the result. Partial gastric exclusion is an operation in which the distal third of the stomach is excluded; the secretion of this part is alkaline and is useful for neutralization purposes; having no function, it gradually contracts and it is always in position should a reconstitution be necessary. The operation is as easy to do as a gastro-enterostomy and has the same therapeutic result as a gastrectomy while the ulcer is permanently cured. The evolution of the operation for partial gastric exclusion is interesting. At first I divided the stomach close to the pyloric muscle; it was then found that the emptying time was about one hour and that the acidity was somewhat lowered. In two instances jejunal ulcer developed because of a high acidity. In later cases I moved the section of the stomach further towards the fundus and subsequent examination showed that as the section was moved towards the fundus, the emptying time became shorter and shorter, while the acidity was correspondingly reduced. Chemical investigation by Dr. Apperly and Dr. Tighe showed that this was really due to a greater regurgitation of duodenal alkaline secretion and only occasionally to a hyposecretion, although theoretically, as no food reached the



pyloric part of the stomach no hormone could be developed to induce secretion of acid, there ought really to be a hyposecretion. In these days, however, there seems to be some doubt thrown on this theory of the secretion of acid. In an analysis of fifty carefully chosen representative operations of the different forms of gastrectomy, gastro-enterostomy and partial gastric exclusion, the latter gave the most satisfactory clinical and chemical results.

In many clinics it was customary to unite the stomach to the duodenum in partial gastrectomy. I have always found this rather difficult, but after I have seen that master of gastric surgery, Dr. Finney, of Baltimore, mobilize the duodenum, I am now able to understand why the operation is more frequently practised with success. Besides dividing the peritoneum on the outer side of the duodenum, Finney also separates the duodenum from the pancreas along the inner side and so mobilizes it that it hangs eventually only by its vessels; in fact, it resembles the duodenum of a dog. A surgeon must be an artist at his work to do this and Finney is. Instead of doing the operation devised by him, Finney told me he is often now inclined to make a section through a wider part of the stomach, near the pylorus, and to anastomose it into the mobilized duodenum, closing the distal end or resecting part of it. This is somewhat like the operation of partial gastric exclusion suggested by me except that the stomach is anastomosed into the duodenum instead of into the jejunum; it is interesting as showing the lines of thought in two different countries.

X-rays were relied on more than any other method for diagnosis in gastric disease, although the different types of test meals were practised, especially the fractional method, but when I saw the extraordinary accuracy with which duodenal ulcer and gastric carcinoma were diagnosed, I could quite understand why they placed such reliance on a method like this that appealed to their vision.

An error in X-ray diagnosis of these diseases was extremely rare and it is safe to assume that this is due to the rule in the Mayo and other clinics that the radiographer must attend at all operations on his patients. In this way half his day is spent at the operating table and the other half at the X-ray table and so his diagnoses are all checked and corrected and a proper scientific humility is developed. Dr. Carman and Dr. Moore, the X-ray specialists of the Mayo clinic, are almost uncanny in the speed and accuracy of their diagnosis. A mixture of barium sulphate, water and sodium bicarbonate emulsified with a motor mixer, is used. The thin mixture is more likely to outline any niche caused by an ulcer. Radiography is usually relied on to make the diagnosis, while photographs are taken as a check.

#### The Surgery of Gastric Carcinoma.

As might be expected from the accuracy of their X-ray diagnosis, carcinoma of the stomach comes earlier to the operation table in America and especially in the Mayo clinic, than in our country and their results are better than ours mainly be-

cause of this fact. The technique of partial gastrectomy in most of the clinics is of a very high order; the operation chosen is generally Pólya's. I noticed that they were inclined to think that more mild post-operative obstruction, generally manifested by regurgitant vomiting, seemed to develop after partial gastrectomy with a long loop for carcinoma than for gastric ulcer. For this reason Balfour was inclined to do an enterostomy between the two intestinal loops as a routine. It took only about ten to fifteen minutes longer and it saved much worry and heartburning. This coincided with my own experience.

In the after treatment of these cases they wash the stomach out twice a day as a routine, until there is no retention and "Milk of Magnesia" is given as a purgative on the third or fourth day.

#### Surgery of the Colon and Rectum.

In no other region of the body has there been of late years more tendency to practise graded abdominal surgery than in that of the colon and rectum. Many of the surgeons admitted to me that their results in the surgery of the colon were not nearly as good as they would like; often under the most perfect conditions unexpectedly bad results were obtained as a result either of a leak or of a mild sepsis or local peritonitis round the anastomosis which interfered with the alimentary function.

In resections of the sigmoid even though there was no obstruction, there was a tendency to remove the growth and to suture the two ends of the intestine together like a double-barrelled gun to form an artificial anus. The very definite spur which subsequently developed, was crushed two or three weeks later; then at a third stage the intestine was loosened under local anaesthesia and allowed to fall in with a few loose sutures to facilitate closing. The results in these cases are remarkably good, though the crushing of the spur is difficult to manage, while incidence of recurrence is apparently not increased. In carcinoma of the rectum a very favourite method at the Mayo clinic and of Dr. Jones, of Boston, was to make an artificial anus with a very good spur, to wash out the lower segment of the bowel for fourteen days and then under sacral anaesthesia at a second stage to remove the rectum by the perineal route well above the growth, closing the peritoneum around the stump and suturing up the cavity as far as possible after leaving some provision for drainage. This left part of the bowel distal to the spur for about seven and a half centimetres (three inches) as a blind pouch. In only one or two in ten of these cases did a fistula result from this pouch; the others gave no trouble. There is no doubt that this is an extraordinarily safe operation because sepsis is the cause of death in nearly all surgery for rectal carcinoma. In malignant disease of the caecum and ascending colon there was a tendency to perform an ileocolic anastomosis with some safety valve such as enterostomy or caecostomy.

I was surprised at the great number of cases of cardiospasm that I saw in the Mayo clinic. I



found that they practised the same method for their relief, namely Plummer's method of hydrostatic dilation, as when I was there many years ago. Vincent and New, the two men in charge of this department, told me that they had tried every other recognized way and had come back to this as the safest and most efficient. I saw them treat many patients and they considered that no cardiac orifice was sufficiently dilated unless the manipulation caused a considerable amount of pain at the time. They said it was extraordinarily difficult to get the dilator in such a position that it caused dilatation of the cardia. I saw them try for half an hour on one patient to find this position. No good effect followed the dilatation which caused no pain. Finally the spot was found and the patient experienced the usual pain. After the dilator was removed, he was at once able to drink a glass of water which he could not do after the dilatation which had not caused him pain.

#### The Goitre Problem.

In the Mayo clinic the outstanding principle in treatment is the administration of "Lugol" as a preparation for operation on a goitre. This is based on Kendall and Plummer's and Boothby's work that in exophthalmic goitre the thyroid secretion is poured out so quickly into the circulation that the molecule of thyroxin is insufficiently iodized and consequently that this disease is really due to a dysthyroidism, while in toxic adenoma we have the normal effect of an excess of thyroxin. Boothby who had charge of the thyroid ward, is most enthusiastic as to its value. He showed me about a hundred patients under treatment and there was no doubt in my mind as to its efficacy. They do not claim that in any way it effects a cure; it merely makes the operation very much safer and avoids the postoperative thyrotoxicosis which is so dangerous. The dose is 0.6 mil (ten minims) three times a day; it is not given to the patient after operation. After this treatment Pemberton and Sistrunk are able to do the operation of bilateral lobectomy, leaving a small portion of the posterior part of each lobe over the recurrent laryngeal nerve, in one stage, whereas in the past staging was always necessary. The operation is done under local anaesthesia, but the patient is tided over the painful part of dislocation of the gland by the administration of a little ethylene or nitrous oxide. Of course, these operators are remarkably dexterous in thyroid surgery and the low mortality (1%) must be as largely ascribed to their skill as to the "Lugol" treatment. Neither Leahy, of Boston, nor Crile, of Cleveland, has obtained the same value from the "Lugol" treatment as the surgeons at the Mayo clinic. These surgeons still find it necessary to operate in stages and to do preliminary ligation, whereas preliminary ligation at the Mayo clinic is practically a thing of the past. It appeared to me that the patients whom I saw at the Mayo clinic, were in a much earlier stage of the disease than those we have to deal with in our country and therefore single operations combined with the "Lugol" treatment should be very cautiously

accepted or practised; circumstances may be different.

#### Neurological Surgery.

The clinics of Danby, the originator of the aerogram, of Frazier, of Grant, of Cushing, of Adson, are full of interest to the neurological surgeon. Progress has been made along the lines of better diagnosis in obscure cases. A careful history and a painstaking neurological examination combined with a great deal of logical thinking sufficed for a correct diagnosis and a precise localization in most cases. In the remaining obscure group of patients ventricular estimation, pressure, contour, communication with the other ventricle or with the fourth ventricle or with the spinal cord can be and is very readily elicited and has proved of great value in localization of tumours. Access to the ventricle is obtained by a small burr opening five centimetres behind the mid-point, seven centimetres from theinion, three centimetres from the mid-line and five centimetres into the brain in plane with the tip of the ear. The cerebro-spinal fluid which is withdrawn, is often coloured and reinserted to test the communication with the other ventricle or air is injected and an X-ray photograph is taken. There is a 5% to 10% mortality after the injection of air, but it must be borne in mind that this test is employed in the grave cases. In spinal cord tumours Quackenstedt's test was considered too unreliable. Though air and "Lipiodol" injections were extensively practised, there were some objections to use of both. In the last, if the result were "negative," the "Lipiodol," a foreign body, remained indefinitely in the spinal cord. At operation the "Lipiodol" could be removed. Considerable value was attached to its use and it was thought that probably it located a block in the spinal cord much earlier than air injection.

Many operations on the fifth nerve are done in these clinics. In all cases the operation favoured was section of the sensory root, exquisitely carried out in all instances under local anaesthesia, the patient being tided over the painful parts with nitrous oxide. Frazier left a small bundle of the sensory root undivided. He maintained that this prevented trophic disturbances in the cornea. Operations on the pituitary tumours that I saw in Cushing's clinic, were carried out through the nasal route and were more of the nature of a decompression than any attempt to remove the tumour.

#### The Surgery of the Lung.

Professor Graham who was the head of a large surgical clinic in St. Louis in which a great deal of surgical investigation was carried out, and Dr. Kelleher of the big surgical hospital in Washington, were the chief exponents of lung surgery. Recognizing that lobectomy carried a mortality of 50% to 60%, Graham has devised a method of removing a lobe or more of the lung piecemeal by cautery for bronchiectatic cavities and chronic abscess. He exposes the lobe of the lung widely. If there are no visceral to parietal adhesions, he induces them; then with a soldering iron he burns away just

as much pulmonary tissue as he thinks the patient can tolerate. This is done in the bed and without any anæsthetic and does not disturb the patient. It may require a good many sittings and some months to destroy the lobe, but all this time the bronchi are draining. The patient has ceased to expectorate pus and his general condition is improving. There may be some difficulty in closing the little bronchial fistulæ that result, but eventually they close either naturally or with some little artificial help. Occasionally hæmorrhage occurs, but is not dangerous because the pressure in the pulmonary artery is low and it is readily controlled by gauze packing; finally, the large opening is closed. Although this method is tedious and long, it has the merit of being very safe and I saw many patients redeemed from a life-long affection by this method. Besides having a great number of patients with this type of lesions, with whom he deals in a manner similar to that just described, Kelleher, of Washington, has also a very great number of patients with chronic empyema under his treatment. His method is to resect the rib and the parietal pleura and to decorticate the lung by removing the thickened pleura sometimes with the knife but often by a chemical decortication. This latter is especially efficient when the pleura is not very thickened. He uses a 2% alcoholic solution of gentian violet. This is applied for two consecutive nights. In some cases where it has been applied too long, a hernia of the lung has resulted. Finally, he practises a method of closure by sliding a muscle into this cavity. Occasionally a cauter method of partial lobectomy has to be combined with this to cure a chronic abscess which has been associated with the chronic empyema.

#### Progress in the Surgery of the Heart.

At present surgery of the heart is almost entirely limited to the laboratory animal. Professor Graham, of St. Louis, uses an endoscope with a specially constructed knife. Professor Cutler, who is the new Surgical Professor in the Cleveland University, uses an ingenious type of punch. Cutler has been able to produce mitral regurgitation and interventricular openings in his dogs with only a moderate mortality. The dogs look well and it is very interesting to listen to the different heart lesions with the stethoscope. He has operated on five human patients, necessarily very bad. Of these, one with mitral stenosis was alive and well. It is not impossible that this work is the beginning of an era of heart surgery. Who knows?

It was delightful to see the plastic surgery of Dr. Valery P. Blair in his clinic in St. Louis. He showed me one interesting case, a patient who had been operated on many times for recurrent carcinoma of the face and finally given up as hopeless. A quack had applied a large arsenic poultice and removed practically the whole side of his face, including the eye and also the jaw and some of the neck. Fifteen months later the carcinoma had not recurred and Blair had used up a large flap from the chest to cover the whole side of the face. He

has discontinued the use of tube grafts and finds that this is not necessary. He makes great use of free skin grafts and has been able to transplant twenty-six square centimetres (forty square inches) in one case.

#### Anæsthesia from the Point of View of the Surgeon.

Local anæsthesia gave such promise of dramatic results that I expected to see a much greater use of this useful anæsthesia. As a matter of fact it has been to a certain extent a disappointment and although very much employed, it has taken its definite place in the world of anæsthesia. As used in combination with nitrous oxide or ethylene or even ether to tide the patient over the painful step of the operation, it is of great value. Its use was limited to certain parts of the body and was dependent upon the temperament of the patient. Paravertebral anæsthesia has great limitations; while splanchnic injection was often found dangerous, spinal anæsthesia is still frequently used and in certain debilitated patients is regarded as almost the safest local anæsthetic. Sacral anæsthesia is widely practised and is of especial value in patients with carcinoma of the rectum, prostatectomy and also for operations on the perineum and anal canal. Its use is attended with a very definite fall in blood pressure which may be attributed to the relaxation of the peripheral vessels; this is counteracted by intramuscular injection of 0.6 mil (ten minims) of adrenalin (1 in 1,000). It was necessary to inject the sacral foramina in a most painstaking fashion as well as the sacral canal.

Nitrous oxide has failed to displace ether as an anæsthetic in the big American clinics. It has its place in anæsthesia, that is in operations other than abdominal or in short abdominal operations combined with ether. After half an hour it is not without some danger. Ethylene is a new anæsthetic offered to the profession after careful animal experiments by Carter and Cuska, of Chicago. It bids fair to become a very valuable anæsthetic. It is much pleasanter to take than nitrous oxide, has a little more anæsthetic effect, gives more relaxation and it has almost as little after effect as nitrous oxide. Its disadvantage is that it is inflammable and already one fatality has occurred from an ignition by a fulguration spark.

In this short talk I have endeavoured to outline some methods of surgery which can be depended on to give reliable results.

#### THE RELATION OF NEURASTHENIA AND ANXIETY NEUROSIS TO THE MANIC-DEPRESSIVE SYNDROME.<sup>1</sup>

By SIR JOHN MACPHERSON, C.B., M.D., F.R.C.P. (Edinburgh),  
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THE manic-depressive syndrome is a mental disorder characterized by the periodic recurrence of states of mental depression or states of mental

<sup>1</sup> Read at a meeting of the Neurological Section of the New South Wales Branch of the British Medical Association on April 16, 1925.

exaltation or of both states alternating or combined.

Periodicity is one of the most characteristic features of the malady and although it may not be always apparent, it is nevertheless capable of demonstration in the great majority of the cases. Some patients may only manifest one or two attacks in a life time, just as some epileptics may have one or two seizures in a life time.

The greater proportion of patients exhibit chiefly attacks of mental depression or attacks of mental exaltation at regular or irregular intervals. In some of these the attacks are separated by long intervals, in others by shorter intervals. When as occasionally happens the history of cases is minutely ascertained, it will often be discovered that in the course of a series of attacks of mental depression a single attack of mental exaltation is interpolated or *vice versa* that in a series of attacks of mental exaltation a single attack of mental depression is interpolated.

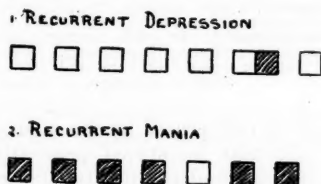


FIGURE I.

The occurrence of these opposite phases in the course of a regular series of attacks of either depression or exaltation leads up to the second great characteristic of the malady, namely, alternation. Alternation manifests itself by the periodic occurrence of phases of depression and phases of exaltation alternating the one with the other in more or less regular succession.

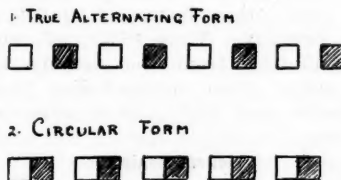


FIGURE II.

The problem of periodicity and alternation is an unsolved one. Periodicity is not an uncommon phenomenon in nervous disease, including the neuroses and psychoses, but alternation is much less common and, as has been mentioned, it is not always present even in well established forms of the manic-depressive syndrome. It is believed by some always to be present, but not apparent. These authorities believe that those who live in intimate association with the subjects of this malady, observe changes in disposition, mood, temper and conduct which are

the insignificant analogues of periodicity and alternation. They also assert that patients who suffer from recurrent attacks of mania, often exhibit slight depressed phases in the intervals and that conversely those who suffer from periodic attacks of melancholia, exhibit temperamental phases of exaltation in between the melancholic attacks.

It is an undoubted fact that the manic-depressive syndrome occurs with considerable frequency in the general population. The subjects themselves are unaware of the significance of their condition and the manifestation of the malady characterized though it may be by periodicity or alternation, seldom suggests to other people the idea of mental disorder.

The number of the clinical forms of the malady is extraordinarily large. There is no private nursing home for nervous affections which does not constantly contain a whole series of them labelled "overwork," "nervous breakdown," neurasthenia, hysteria and so on.

It is, I believe, capable of demonstration that the subjects of the manic-depressive syndrome manifest from an early age instability of moods and temperament. Some of them suffer from depressive, others from exalted moods, with a tendency to periodicity of one or other of these moods or to an alternation from one mood to another.

The ætiology of an obscure malady of this kind naturally gives rise to much speculation. Kraepelin comes nearer a solution than any one else in his description of what he calls "fundamental states." As these states are in his view permanent morbid emotional peculiarities which may exist without characteristic attacks, he classifies them among the clinical forms of manic-depressive insanity.

The existence of these fundamental states is not limited to the subjects of the periodic attacks, but is also observed with special frequency in the families of those who suffer from this malady. In the case of many of the subjects of the malady they may be observed with more or less clearness from an early age before the appearance of the attacks as well as in the intervals between the attacks.

Indeed in the more pronounced cases the attacks may fairly be regarded as exaggerations of the fundamental emotional disorder. Kraepelin describes four fundamental states of temperaments, namely:

- (i.) The depressive,
- (ii.) The manic,
- (iii.) The irritable,
- (iv.) The cyclothymic.

At the adolescent period, that is from fifteen to twenty-five years, these temperamental emotional moods tend to become emphasized and in persons with a strong hereditary tendency (the heredity in the manic-depressive syndrome, taking ascendants and collaterals together, is from 80% to 90%) they determine the form and the succession of the attacks at any rate in the earlier stages of the malady.



We may, therefore, conclude that the manic-depressive syndrome depends upon an inborn, congenital defect of the organism which is ineradicable and irremediable and of which the mental depression, the mental exaltation, the periodicity and the alternation are the phenomena.

I shall refer only to one of the fundamental states, namely the depressive temperament. As this condition so closely resembles the mental and physical symptoms and the constitutional make-up of many of the subjects of neurasthenia, anxiety neurosis and psychasthenia, its general description is most important for my present purpose.

The subjects exhibit from an early age and some of them throughout life a tendency towards mental depression. While their mental efficiency is as a rule good, their success in and their enjoyment of life are apt to be hampered at every turn by scruples, fears, apprehensions and anxieties. They lack self-confidence and are painfully aware of their own limitations. The fact that other people with less intellectual ability succeed where they fail, adds to their unhappiness.

They are often sexually precocious and their sexual passions which are strong and not well controlled, find expression in debauchery or masturbation. The painful memory of these experiences becomes an obsession with many of them to which they attach excessive ethical and physiological importance. The train of distressing mental symptoms which sometimes take their colour from this source, is an endless one. Most of these people harbour thoughts of suicide, some attempt it, a few successfully.

On the physical side they are subject to frequently recurring neurasthenic attacks characterized by fatigue, heaviness or dull pressure in the head, paresthesias, cardiac oppression or palpitation. Sleep is as a rule defective, accompanied by terrifying dreams, nocturnal emissions and usually by an exhausted feeling in the morning.

This fundamental depressive state may slowly merge into recurrent attacks of anxiety neurosis or melancholia and after a time an attack or attacks of mental exaltation may complete the picture.

The manic-depressive syndrome is a non-progressive malady in so far as there is little tendency to dementia. The morbid anatomy of the nervous system, beyond some degree of chromatolysis which disappears, is unimportant. The only exception is in the recurrent maniacal form where there is, though not always, a tendency to dementia and where neuroglial, vascular and neuronic changes and degenerations may occur.

In the earlier stages of the depressed phase and throughout the whole attack in the milder forms of that phase the physical symptoms are indistinguishable from those of neurasthenia. Clouston is emphatic on this and he has shown that when the mental depression deepens or when the patient comes under care in a mental hospital, the physical symptoms are not complained of. They appear to be

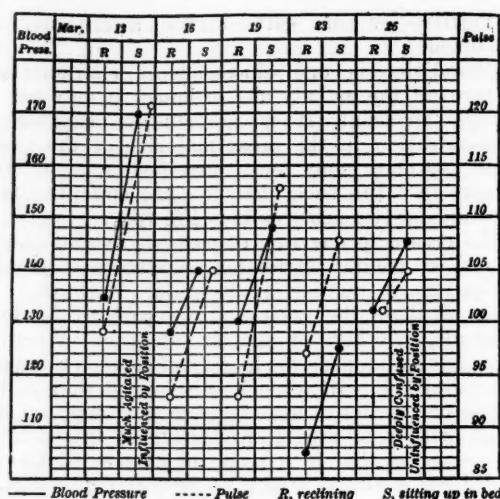


FIGURE III.

Case of Manic-Depressive Insanity. Depression with anxiety. To illustrate differences in rapidity of pulse and in blood-pressure in the sitting and reclining postures respectively. Variations are greater than normal (from Stewart Paton).

overshadowed or obliterated by the mental pain and depression. It may be stated generally that the physical symptoms and the mental depression vary inversely the one with the other. The greater the depression, the less the complaint of the physical symptoms and conversely the more the physical symptoms bulk in consciousness, the milder is the depression.

The accompanying chart, borrowed from Stewart Paton's text book on "Psychiatry," is significant in so far as it indicates the influence of progressive psychomotor retardation upon the vasomotor and circulatory system (see Figure III.).

For my argument it is important to point out that states of mental depression are predominantly more numerous than other forms or states of manic-depressive insanity. Thus 48.9% of the patients admitted suffering from the malady to mental hospitals suffer from melancholia, 16.6% from manic attacks and 34.5% from alternating and mixed states.

#### Neurasthenia.

Notwithstanding the modern tendency to divide the psycho-neuroses into numerous classes I incline to the view of Janet, Hurst and others that they resolve themselves into two main types—psychasthenia including neurasthenia and hysteria. Even if we accept such a simple division, it is found on the testimony of those most competent to judge that there is no pure type, but that cases of the one type are often complicated by symptoms of the other.

The neurasthenic type expresses itself mentally by depression or anxiety or both, by lack of nervous energy, restlessness, irritability and enfeeblement of memory, physically by disorders of the autonomic nervous system and endocrine glands, insufficient

sleep, vasomotor and circulatory disturbances and gastric and intestinal disorders.

The hysterical type expresses itself mentally by definite amnesias, somnambulisms, anxiety or maniacal delirium, physically by paralysis, contractures, convulsions, anæsthesias, disorders of vision and so forth.

I shall here confine myself to the neurasthenic type because it is my object to delimit from the present chaos of that group cases which can more properly be included in the manic-depressive group.

Excluding for clearness of exposition cases of nervous exhaustion due to malnutrition, infection and traumatism there remains a group of cases commonly labelled neurasthenia, some of which in recent years have come to be known as anxiety neuroses. My contention is that the majority of these cases belong in reality to the manic-depressive group. It must be admitted that a minority of them, the proportion of which to the whole number I am unable to estimate, are of purely psychogenic origin caused by some exceptional environmental stress. It is comparatively easy by reference to the previous history and by awaiting future developments to determine those which are allied to the manic-depressive syndrome.

If a case of neurasthenia is to be diagnosed as belonging to the manic-depressive group, it must conform clinically to the following features of the group which I shall enumerate.

#### 1. Depression.

It is of the very nature of mental depression to lose the ordinary feeling of enjoyment of life, *joie de vivre*. But there is in addition something more, namely a varying degree of psychomotor retardation. If continuous neural activity which determines normal mentality, depends on the uninterrupted influx of afferent sensations, it follows that any interference with this afferent flow must result in psychomotor retardation. The reflex psychomotor arc is interrupted and there are only two points at which this interruption can occur, namely either at the thalamic or at the cortical level. The result is the same in either case, but in the manic-depressive syndrome and in neurasthenia the indications are that the interruption is at the cortical level. That the depression and the psychomotor retardation are two aspects of one symptom is evident from the fact that they rise and fall concomitantly. That they depend upon a cortical neural resistance is probable, because the opposite often alternating condition of mania is undoubtedly accompanied by a lowered cortical neural resistance.

The existence of depression and psychomotor retardation in the depressed phase of the manic-depressive syndrome is so obvious as scarcely to require demonstration. In neurasthenia it requires, I believe, only to be pointed out to be equally clear.

No neurasthenic has the same pleasure in life as when he was in his normal condition. He finds thinking difficult, his faculty of attention and his memory are both defective, he is unable to concen-

trate for any length without exhaustion and physical exertion is followed by fatigue. Finally his deep reflexes (such as the patellar) are exaggerated. All these and other symptoms point to depression of cortical neurones and psychomotor retardation.

In the simpler forms of mental depression psychomotor retardation is not a more prominent feature than in ordinary neurasthenia, but it is nevertheless present in both conditions in approximately the same degree. The patients complain of fatigue on exertion whether physical or mental, of lack of power of concentration, of difficulty of thinking and of loss of memory. But we must not forget that there is every shade and degree of psychomotor retardation linking up these milder cases with the complete psychomotor retardation which is seen in melancholic stupor.

#### 2. Anxiety.

This term is an unfortunate one and like many other terms used in modern psychopathology it is misleading. Anxiety invariably accompanies all forms of pathological mental depression of whatever kind. But what most writers mean when they use the term is not anxiety, but anguish or despair.

In the milder forms of mental depression the patients are anxious about their physical symptoms, apprehensive of some impending calamity and afraid of losing their reason. Neurasthenics are especially anxious about their physical symptoms which are of a particularly disagreeable and alarming nature. Their inability to concentrate, the difficulty of thinking and especially the affections of memory give rise to anxiety regarding their sanity. I believe that 99% of neurasthenics have this fear.

Many of the subjects of simple mental depression and many neurasthenics are liable to acute emotional storms. These may occur several times during the twenty-four hours or less frequently. The attack starts with a definite physical sensation most frequently a precordial oppression or a tachycardia or an epigastric sensation or a paræsthesia in a limb or in the head or face. During the attack the blood pressure rises rapidly and the pulse rate is accelerated. There is great mental distress or anguish and uncontrolled emotional manifestations. The blood pressure falls as rapidly when the storm passes off and there ensues in many cases sweating of the hands and feet followed by coldness of the extremities. This is known as anxiety melancholia and anxiety neurosis which have been erected into special clinical entities.

The Freudian school draws an ætiological distinction between neurasthenia and anxiety neurosis. The former they say is due to the repression of auto-erotism and the latter to sexual stimulation without gratification. These ætiological views have been practically rejected by all authorities outside the Freudian school itself. In the more modern text books, however, the authors of which accept the Freudian classification though not necessarily

the Freudian ætiology, neurasthenia and anxiety neurosis are separately described. Speaking for myself I may say that a perusal of these separate descriptions leaves me without any clear appreciation of the difference between the two. In actual practice the difficulty of differentiating them is still greater. When we meet with patients in whom the mental and physical symptoms are either mild or monotonous, we say they are suffering from neurasthenia or from simple mental depression as the cases may be. When we meet with other patients subject to frequent emotional storms we say they are affected with anxious melancholia or anxiety neurosis as the case may be.

We forget that every melancholic and every neurasthenic suffers from anxiety and is liable to emotional storms. The fact that in some cases these emotional storms are frequent or severe, does not justify us in placing them in a special clinical category with a special ætiology of their own. I am not arguing against labelling the varieties of mental depression neurasthenia or hysteria for purposes of clinical description, but against the pernicious modern practice of elevating these varieties into superfluous disease entities.

### 3. Suicidal Tendency.

The subjects of milder mental depression and of neurasthenia have complete insight into their own condition. If they misinterpret the nature of their symptoms and the consequences which may arise from them, that is not due to any fault in their reasoning power or to the premises they reason from. Their symptoms are painful and distressing much more so than appears objectively and it is only natural that they should be alarmed and apprehensive. Nor is it, strictly speaking, remarkable that owing to continuous mental depression and an inability to enjoy life they should harbour thoughts of suicide or that during emotional anxiety storms some of them should take their own lives.

### 4. Gastro-Intestinal Disturbances.

As I have said, the physical symptoms in the early stages of melancholia and in the milder forms throughout the whole attack differ in no respect from the physical symptoms of neurasthenia or anxiety neurosis. Of all the physical symptoms the most constant and persistent are disorders of the gastro-intestinal tract. These disorders almost invariably either precede or accompany attacks of melancholia or of neurasthenia. So much so that some authorities regard them as causative factors. In his very instructive lectures on neurasthenia Saville takes this view and Ford Robertson and Cotton both look upon toxæmia of gastro-intestinal origin as one of the causes of manic-depressive insanity.

While recognizing that striking results are often obtained from the vigorous treatment of these disorders in the maladies we are considering, there can be no doubt whatever that these gastro-intestinal disturbances are symptomatic.

Not only so but they occasionally form the only symptoms of melancholia or neurasthenia as the case may be.

They often precede the appearance of other symptoms.

They may form the whole attack save for some slight accompanying anxiety or depression.

They are, as a rule, refractory to ordinary remedies employed for the relief of such disorders.

They often exhibit variability in their manifestations as well as intermittency in their course. They may disappear for a few hours or a few days and then return.

They may occur periodically or alternate with other forms of nervous disturbance in the same individual.

If those nervous disturbances which at present we indiscriminately call anxiety neurosis or neurasthenia, are in reality manifestations of the manic-depressive syndrome, they must conform to the general character of that syndrome in respect particularly to the features of periodicity and alternation.

### 5. Periodicity.

If the history of the patients be carefully investigated it will be found that most of them have experienced previous attacks, some of them one or two, others of them many attacks.

When a patient is questioned on this point, it is quite common to receive the reply: "Yes! I had a breakdown five, seven or twelve years ago" as the case may be. On closer questioning it may often be discovered that slighter attacks have occurred in the interval.

The following chart illustrates the recurrence of periodic attacks of neurasthenia or anxiety neurosis in patients who have come under my personal observation. For economy of space attacks prior to 1909 are not shown.

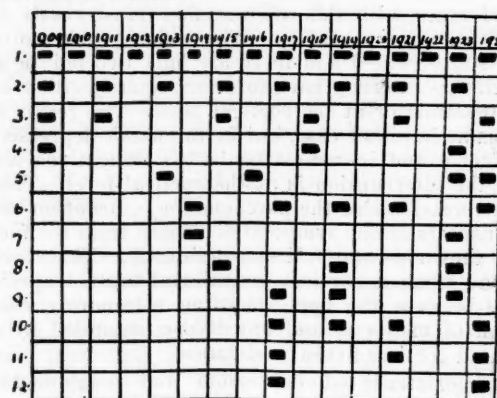


FIGURE IV.

Patient 1.—Attacks every year since he can remember.  
Patient 2.—Repeated attacks since childhood.  
Patient 4.—The second attack was one of indigestion.

### 6. Alternation.

With regard to alternation in these cases examples are necessarily fewer, just as in the manic-depressive



syndrome only about 34% of the patients manifest it unmistakably. Yet in many neurasthenics alternation is often evident to the experienced observer, though in a manner which it is not easy to demonstrate convincingly to others.

For instance, it must be within the experience of many physicians to have one of these patients suddenly burst into his consulting room some fine day exuding gratitude for the cure effected. It is no doubt a gratifying experience compensating us for the disappointing progress of other apparently similar cases. But such an experience is too common in psychiatric practice to be regarded otherwise than as the quick rebound from the feeling of ill-health accompanying mental depression to the exuberant feeling of well being accompanying mental exaltation.

A considerable number of patients usually labelled neurasthenia or anxiety neurosis exhibit cyclothymic fluctuations of mood and occasionally there is observed in them a mixed state of mild excitement followed immediately by depression.

But a true alternation of depressed and exalted states occurs in patients whose mental and physical symptoms would appear to justify their inclusion in the neurasthenic group as that term is at present understood. Without reference to the previous history of these patients or without any experiences of subsequent developments it is not possible to differentiate between the depressed phase of the manic-depressive syndrome and the so-called neurasthenia or anxiety neurosis.

#### Illustrative Cases of Alternation.

L.R.M., a male clerk, aged forty years, was admitted to Broughton Hall on September 6, 1922. He stated that he had had a nervous breakdown in 1911.

On admission the patient was sleepless. He said that for weeks he had only had two hours' sleep in the twenty-four hours. He complained of "eye strain" but not of headaches and of his memory being bad. He was ultra-religious and inclined to talk on that subject. He complained of feeling "run down" and of fatigue.

On September 22, 1922, he said that he felt "tip-top" and was sleeping well. He thought that he would give up indoor clerical work and become a gardener. He was talkative and optimistic about himself and his future.

He was discharged.

He was readmitted on April 27, 1924. Eight months after discharge from the hospital he had begun to suffer from insomnia, fatigue and nervous depression which had lasted for several months. He was elated and stated that he had been "born happy." He was very restless and talkative. He had no hallucinations nor delusions.

He was discharged on May 15, 1924.

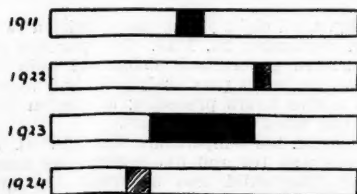


FIGURE V.—Patient L.M.

C.G., a female, aged thirty years, a saleswoman, was admitted to Broughton Hall on December 18, 1922.

She began to feel languid and tired about a year previously, gave up work and remained at home. She felt miserable and depressed.

Her physical symptoms were as follows. She had been obstinately constipated for over a year. Her menses had ceased. She had insufficient and disturbed sleep, sweating of hands and feet, a numb feeling in her arms and head and often a pressure on the crown of the head. She had lost 12.7 kilograms (two stones) in weight during the past year.

On February 12, 1923, her menstruation reappeared. There was, however, no distinct improvement in her symptoms until November 30, 1923.

She was discharged recovered on March 26, 1924. On January 1, 1925, she called at the hospital to show them how well she was. She had resumed work as a saleswoman and had regained her lost weight. She was bright, active, over loquacious and manifested the usual symptoms of hypomania. She stated that she rose every morning at 5.30 a.m. and did the household work before going to business.

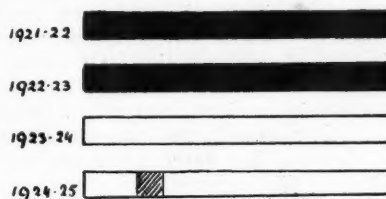


FIGURE VI.—Patient C.G.

W.E., a female, aged forty-five years, was admitted on June 21, 1924, from Queensland. She had been nervous all her life. The history of previous attacks was indefinite except for one in 1919, when she was worried and sleepless, but details were not ascertained. The duration was not known. The present attack began in December, 1923. The symptoms were fatigue, worrying about trifles, insomnia and constipation. On admission she was emotional, anxious, weeping and wringing her hands. She showed indecision and fears. She had complete insight into her condition. Physically she was very thin; she complained of malaise and various subjective sensations. Her appetite was poor, she was obstinately constipated. Her blood pressure was 120 millimetres systolic and 78 millimetres diastolic. She slept badly. On July 22, 1924, she showed a tendency to become loquacious and gradually

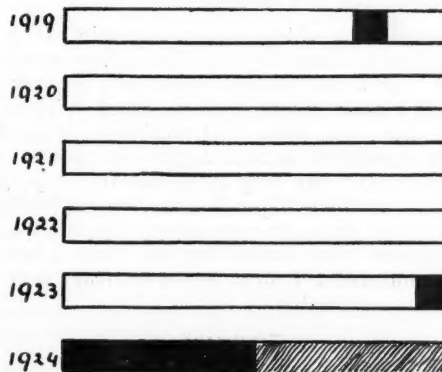


FIGURE VII.—Patient W.E.

passed into a condition of hypomania without any evident restlessness or intellectual disorder. There were no hallucinations or delusions.

She was discharged recovered on December 27, 1924.

In conclusion something must be said on the question of delimiting those forms of neurasthenia or anxiety neurosis which belong to the manic-depressive group. I have already guarded myself by excluding cases arising from traumatism, exhaustion, malnutrition or infection. I did so principally for purposes of clearer definition. We know, however, that attacks of the manic-depressive type may be occasioned in persons predisposed by any of the causes mentioned. On that ground it might be argued that the exclusion of all such cases was unnecessary, but for the present I prefer to leave the matter alone.

The next point concerns cases with an obvious psychogenic origin. The differentiation of such cases from the manic depressive group is often difficult if not impossible. Even a mental analysis is not always convincing to those who are accustomed to the perfectly candid but frequently erroneous rationalization of melancholics. Of course if the cause which is either an impending personal misfortune or a failure of adjustment to the environment, can be removed, the patient immediately recovers. On the other hand it is a matter of common experience that psychic causes may precipitate an attack of manic-depressive insanity. But the removal of the cause does not as a rule affect the duration of the attack which runs its ordinary course. When it can be shown that patients in whom an attack was precipitated by psychic causes, have had previous and subsequent spontaneous attacks and have experienced subsequent psychic shocks without having had an attack, the argument in favour of all attacks being psychogenetic loses much of its force.

I have pointed out (i.) that the manic-depressive syndrome depends upon an underlying hereditary, temperamental disposition of which the various symptoms constituting the malady are merely the outward phenomena, (ii.) that the underlying condition is, so far as we at present know, irremediable, (iii.) that the attacks appear spontaneously, run their course and end spontaneously.

A contribution which ends on so pessimistic a key, may appear to some of you to be neither useful nor helpful. As to its utility I shall only remark that so far as I know, apart from scattered opinions the subject has not been systematically treated in English psychiatric or neurological literature. That being so I felt it my duty to discuss it, for progress in clinical medicine depends upon the realization of facts whether these are agreeable or the reverse. So far, however, from considering the views I have set forth as unhelpful, I think on the contrary that they may prove serviceable.

#### Treatment.

In treating any disease we are more concerned with the existing symptoms of the malady than with

the diathesis upon which it may depend. In the manic-depressive syndrome the prognosis as regards the individual attacks is on the whole exceptionally good. We can almost always assure the patients of this with beneficial effect. Although recovery from the individual attacks is spontaneous and although the attacks tend to run a definite course, a great deal can be done to allay suffering and to shorten their duration. I am referring particularly to the milder forms of mental depression and to neurasthenias of the manic-depressive type. If we know that a patient belongs to this type we should impress upon him the necessity of applying for treatment whenever he feels that an attack is impending. It may then be possible to arrest or avert it.

When the symptoms are fully developed, the task is much more difficult, but we can still hope to allay the painful symptoms and shorten its duration. I can only in a paper of this kind indicate the headings of the therapeutic measures which are at our disposal and which are indispensable in the treatment of most of the patients, however mild their symptoms may appear.

1. Rest in bed for a definite period.
2. The promotion of sound sleep.
- \*3. The alleviation by drugs of the painful sensory symptoms.

4. The steadying by drugs of the vasomotor mechanism when its oscillations are disturbing or alarming to the patient.

5. Attention to the gastro-intestinal disturbances.

Psycho-therapeutics which consciously or unconsciously influence the progress of most diseases, have a distinct place in the treatment of this affection. In the earlier stages of an impending attack it is possible I believe by suggestion under slight hypnosis to avert the attack. When the symptoms have developed, much can be done by assurance and explanation to comfort the patient and allay his anxieties. When, however, the sensory disturbances are acute, suggestion, in my experience, is useless until the resulting discomfort and distress have been allayed by other means.

### Reports of Cases.

#### A CASE OF INTUSSUSCEPTION FOLLOWED BY VOLVULUS.

By J. H. W. LEADLEY, M.B., Ch.M. (Sydney).  
Resident Medical Officer, The Coast Hospital.

A.W., a boy, aged eight years, was admitted to the Coast Hospital on September 24, 1924. His parents supplied a history of severe generalized abdominal pain of sudden onset twenty-four hours previously. He had vomited twice during the twelve hours preceding admission to hospital. His bowels had acted the day before.

On examination his temperature was 37.8° C. (100° F.), the pulse rate was 100 and his respirations numbered 28 per minute. The child was apparently in great pain, writhing in bed, with knees drawn up. The abdomen was slightly distended, moved freely on respiration and there

was no rigidity of the muscles of the abdominal wall. A tender soft mass was palpated in the lower part of the abdomen; it moved on respiration and could be palpated bimanually with one finger inserted into the rectum.

An enema was given resulting in the passage of a normal stool and some flatus.

Immediate laparotomy was decided upon and on opening the abdomen through a right paramedial incision, an enteric intussusception was delivered. About sixty centimetres (two feet) of ileum, including the gangrenous intussusception, were resected and a lateral anastomosis was performed.

A small enteric fistula developed three days later, but quickly closed when the normal peristaltic action of the bowel was reestablished.

On October 16, 1924, twenty-two days after the operation, the child was again seized with sudden severe abdominal pain of a colicky nature.

The lower bowel was evacuated by enemata and comparatively large doses of morphine administered without relieving the pain. His temperature remained normal, but the pulse rate advanced to 128 per minute. The pain appeared to be too violent to have been caused by the more usual types of post-operative obstruction such as kinking of the gut or occlusion by a peritoneal band.

I reopened the abdomen by a left paramedial incision and a volvulus comprising about thirty-eight centimetres (fifteen inches) of ileum was disclosed; this was untwisted and found to be quite remote from the site of the previous anastomosis. A peritoneal band which passed across the neck of the volvulus may have been the exciting cause of the torsion, though not sufficiently tight to have caused obstruction *per se*.

Apart from the reopening of the old fistula for a few days, the child made a good recovery and was discharged on November 26, 1924. He has reported at intervals since and is well.

#### SARCOMA OF THE KIDNEY.

By R. GORDON CRAIG, M.B., Ch.M. (Sydney),

*Honorary Urologist, Royal Alexandra Hospital for Children, Camperdown, Sydney.<sup>1</sup>*

A female child, aged twelve months, was admitted to the Royal Alexandra Hospital for Children. The child had been wholly breast fed. It was the first baby of healthy parents and had been quite well in every way until one week previously when the urine had become dark in colour. No other signs or symptoms were present.

On examination it was seen that the child was poorly nourished, it was not irritable, but it was somewhat pale. No abnormality could be detected in the circulatory or the respiratory systems. The abdomen was soft and moved freely. No increase in either hepatic or splenic dullness was detected. A definite tumour was palpable to the right side of the umbilicus. It could be moved slightly, was dull on percussion and the dullness was not continuous with that of the liver.

On April 3, 1925, cystoscopy was performed and a pyelogram was taken. The pyelogram revealed an irregular shadow with definite filling defects in the lower pole and three areas of pyelo-venous overflow. The urine from the bladder proved to be sterile on culture, but contained a few red cells. The urine from the right ureter was sterile on culture and contained a few pus cells. The urine from the left ureter was sterile on culture and no cells were found on examination.

On April 6, 1925, the right kidney was removed and the lower pole of the kidney was found to be involved in a friable growth adherent in one place to perirenal tissue. Dr. Keith Inglis examined the growth and reported that it



was a malignant neoplasm with sarcomatous structure. It was composed of small round cells and small spindle cells. Nutritional necrosis was conspicuous and some canary yellow pigment of doubtful nature was present. Dr. Inglis thought the structure of the growth was unlike that of a Grawitz or Wilms tumour. Further investigations are being made.

At the time of the meeting at which the specimen was shown, the wound had healed, the patient's condition was good and she was passing a normal quantity of urine.

#### MALIGNANT DISEASE OF THE KIDNEY.<sup>1</sup>

By J. SHEDDEN DAVIS, M.D., Ch.M. (Sydney),

*Honorary Assistant Surgeon, Royal Alexandra Hospital for Children, Camperdown, Sydney.*

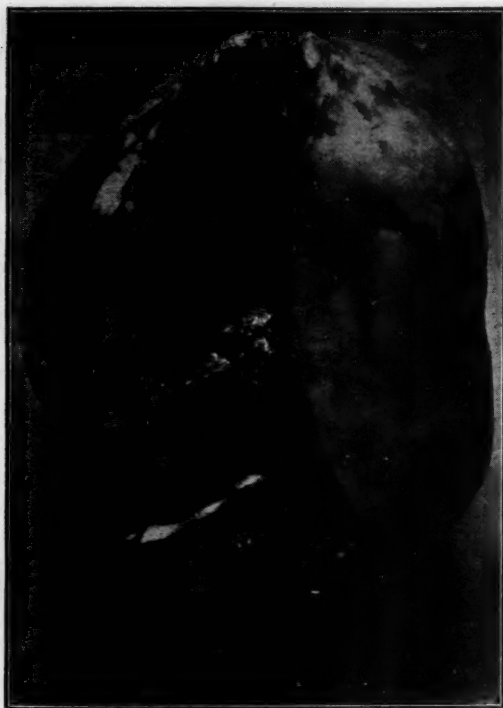
C.M., a male patient, aged fifteen months, was admitted to hospital on March 20, 1925, the child was a breast fed baby and had always been healthy. A fullness had been noticed in the left side of the abdomen when the child was five months old. This was associated with severe constipation necessitating the use of enemata, the fullness gradually became greater and the urine scanty and offensive. The general condition of the child was good and it had not lost weight.

On admission it was seen that the child was well nourished, the circulatory and respiratory systems appeared to be normal. Examination of the abdomen revealed a large, hard, fixed swelling occupying the left side and extending to the mid line and below the umbilicus. The spleen was palpable and apparently normal in size. No

<sup>1</sup> The specimen herein described was shown at a meeting of the New South Wales Branch of the British Medical Association on April 16, 1925.

<sup>1</sup> Read at a meeting of the New South Wales Branch of the British Medical Association, on April 16, 1925.





blood cells nor tumour cells were found in the urine. On examination of the blood it was found that the erythrocytes numbered 4,200,000 per cubic millimetre, the hæmoglobin value was 45% and the colour index 0.5. The leucocytes numbered 10,000 per cubic millimetre and of these 42% were neutrophile cells, 48% were lymphocytes and 3% were eosinophile cells.

Operation was undertaken on March 26, 1925, and a tumour comprising the whole of a large kidney was shelled out; very few adhesions were encountered.

Dr. Keith Inglis examined the tumour and reported that no recognisable kidney substance was to be seen. He said that the lesion was a malignant neoplasm, but that its exact nature was difficult to determine. It had no resemblance to a Grawitz tumour or a Wilms tumour. It was composed of masses of small oval and spindle shaped cells with conspicuous nuclei and little cytoplasm. The structure for the most part closely resembled a sarcoma but the way in which the cells were arranged in compact masses separated by somewhat myxomatous connective tissue, suggested to him that the growth might have sprung from epithelial structure and not from connective tissue.

On April 16, 1925, the wound was healed, the child was well and was passing a normal quantity of urine. The tumour is shown in the accompanying illustration.

## Reviews.

### A FRENCH STUDENTS' HANDBOOK.

DR. GASTON LYON has written a "Manual of Clinical Symptomatology, Including Diagnosis, Prognosis and Treatment" for the use of the beginner in the ward work of a hospital.<sup>1</sup> It is written, he states in his preface, to help the student who is helpless before his hospital patients. It is intended to show him how to take a history, to examine the patient, to make a diagnosis, to

determine treatment and to give a prognosis, all in seven hundred octavo pages. It is a sort of French "Hutchison and Rainy." No illustrations are used and there is no detailed account of laboratory methods and tests, but many clinical examples especially illustrating difficulties, are quoted.

It is written in the usual lucid French of scientific works and can be read very easily; owing to the very lucidity of the French, it is not at all easy to translate. The book is divided into six parts: (i.) History taking, (ii.) examination, (iii.) laboratory methods, (iv.) the detailed examination of the various systems and the chief question of symptomatology, (v.) prognosis, (vi.) therapeutics.

Of these easily the best is that on history taking, the weakest that on laboratory methods. Most of the laboratory methods are merely indicated and the significance of variations given; the ordinary routine tests are those in general use in British countries. The tests for renal efficiency are very out of date. Neither phenol-sulphone phthalein nor urea concentration tests are mentioned. All through the book there is a constant illustration of points by clinical examples and these are put in a way that suggests the teacher speaking to his class. There is a special section on infectious diseases among which is included acute articular rheumatism and an excellent article on syphilis.

In common with many modern writers, the author devotes much space to endocrines; he has less belief in substitutive therapy than have some authors, but more than such conservatives as Swale Vincent or Schafer. The page on methods of examination in endocrine disorders contains much suggestive material with reference to every possible aspect which the student is likely to encounter.

The chapter on prognosis is short, but written with the same clearness and ease. It is a general chapter followed by prognosis in special cases. The chapter on treatment is short and vague; it is written on general lines and the bane of much French medicine, "etc.," is everywhere too common.

As is to be expected in a French textbook much stress is laid on diet.

To anyone with even a slight knowledge of French this little book would be a source of much interest and profit. It would be an excellent work for anyone attending teaching classes in a French medical school.

### PROGRESS IN CLINICAL SURGERY.

THE object of "The Practical Medicine Series," as stated by the editor, is to give the busy surgeon in a compact form a fairly complete review of the past year's important literature of clinical surgery. It covers a large field chiefly selected from American journals.

Every surgeon will find in it something to whet his appetite for further reading. It is in fact something like a dish of *hors d'œuvres*, the *bon vivant* can select two or three, but it would be fatal to satisfy his appetite from them to the ruin of the dishes which ought to follow.

There are many seductive little tit bits. Some about new technique for certain operations, some of new instruments invented to make a recognized procedure easier, some of new ideas in regard to the pathology of diseases which have been to the fore during the year.

By dividing his subject up anatomically the editor has managed to make it less disjointed than it would otherwise have been. This method allows the reader an opportunity to use it as a reference book and this fact makes it of far greater value than it otherwise would have been, especially if it is made an annual addition to his shelves.

The clipped phrasing, the weeding out of particles and the American spelling somewhat detract from the pleasure of reading, but no doubt reduce the bulk of the volume.

<sup>1</sup> "Précis de Clinique Sémiologique," par Gaston Lyon; 1924. Paris: Masson et Cie. Post 8vo., pp. 733. Price: Francs 28, net.

<sup>2</sup> "The Practical Medicine Series, Comprising Eight Volumes on the Year's Progress in Medicine and Surgery": Under the General Editorial Charge of Charles L. Mix, A.M., M.D.; Volume II: General Surgery; 1924. Chicago: The Year Book Publishers. Crown 8vo., pp. 706, with illustrations.

## The Medical Journal of Australia

SATURDAY, JUNE 13, 1925.

### The Modern Doctrines of Cardiology.

THERE are many medical practitioners who look askance at the laboratory and who boast that their practice is based on clinical experience and not on the doctrines of the sciences of physiology or pathology. They delight in pointing to the results of the application of certain doctrines which have emanated from the scientific investigation of biological phenomena and which do not appear to withstand a crucial test at the bedside. This argument necessarily fails because if a doctrine is based on physiological truths or proven facts in pathology, the only possibility of error is to be sought in the interpretation of the doctrine and in its clinical application. The discovery of each of the important truths in physiology, biology and pathology has been received with scepticism and with a disinclination on the part of the practising profession to alter its views in accordance with the new teaching. It must be admitted that almost all the exact knowledge possessed today of the causation of disease, of the detection of pathological processes, of the changes produced in the tissues and organs by pathogenic agents and of the rational methods of treating disease are based on the results of scientific investigations and experiments and not on clinical observation. He would be a bold man who would deny the correctness of the diagnosis of pulmonary tuberculosis founded on the detection in the sputum of the bacillus of Koch, even if the symptoms and physical signs do not appear to corroborate such a finding.

Medical practitioners today have not the same excuse for resisting the teaching of the physiologists and pathologists as had the doctors of the second half of last century. The younger men and many of the senior ones have been well versed in scientific research and experimental work and should in consequence be able to evaluate doctrines

based on proven facts. In no chapter in medicine is the change of doctrine as a result of physiological discovery more evident than in cardiology. Formerly it was taught that a rheumatic or other infection at times gave rise to certain inflammatory lesions of the valves of the heart and that the subsequent disability of the person so affected depended on the failure of the cardiac valves to prevent a backward leakage from the auricle to the ventricle or from the aorta into the auricle or on the obstruction of rigid and fixed valve cusps to the smooth onward flow of blood within the heart or into the great vessels. This doctrine was very firmly established because it was possible in the *post mortem* room to demonstrate the vegetations on the edges of the cusps and to watch the failure of the valves to sustain a short column of fluid after the removal of the organ. The histological studies of great physiologists led to the recognition of a highly complex neuro-muscular mechanism which is responsible for the proper discharge of the cardiac function. Starting on the proven facts of waves of muscular contraction initiated at definite points in the cardiac wall by autonomic ganglion cells, the modern cardiologists discovered that under certain conditions the normal passage of nerve currents was disturbed and that this disturbance could be measured by its effect on the contraction of the cardiac muscle. The variations of the electrocardiographic records resulting from pathological lesions of the heart set them to investigate the condition of the musculature with the result that evidence was collected to show that the valvular lesion is of minor importance; the change in the muscular tissue itself determines the degree of disability of the heart as a vital organ. The careful and accurate study of the cardiac arrhythmias, of auricular and ventricular flutter and fibrillation and of heart block led to the recognition of the importance of the coordination between the outflow of nerve impulses from the ganglia into the auriculo-ventricular bundles of His for the governing of the rhythmical succession of contraction waves synchronizing on the two sides of the heart. The elaboration of the doctrine of circus movement threw further light on the complicated neuro-

muscular mechanism on which the continuous action of the heart depends. From time to time we have published admirable articles by Australian cardiologists descriptive of the interpretation of the polygraphic tracings, electro-cardiographic curves of Einthoven and of the doctrines elaborated by Mackenzie and Lewis. It would be vain to suggest that we have yet attained a full understanding of the mechanism or that the final interpretation of the graphic and physical signs of disordered action of the cardiac muscle has been given. Enough has been demonstrated to prove that the old conception is untenable and that it is futile to estimate the degree of cardiac damage by the character of a murmur or to base the treatment of a patient with heart disease on the assumed condition of the cardiac valves. If the practitioner wishes to form as accurate a conception of the condition of his patient's heart as is possible, he must endeavour to forget the teaching of but a few years ago and substitute for it the doctrine of the disordered heart muscle.

### Current Comment.

#### POLYPOSIS OF THE COLON.

THE occurrence of multiple polypi in the mucosa of the gastro-intestinal tract is by no means rare. Sometimes the polypi are numerous and one or more may attain a relatively large size. Sometimes the change may be so extensive that the mucosa of a certain segment of the gut assumes a characteristic polypoid appearance to which the term polyposis has been applied. Hanser and Kaufmann recorded a case in which the entire mucosa from pylorus to anus was affected by this condition. Diffuse polyposis occurs in the stomach and has been known as *gastritis polyposa*. In December, 1922, observations by G. Percival Mills on this lesion were discussed in this journal. Mills contended that the term *gastritis polyposa* was a misnomer in that it presupposed an inflammatory origin.

In August, 1924, we drew attention to observations by J. E. Struthers on multiple polyposis of the gastro-intestinal tract. He averred the correctness of the term *gastritis polyposa*.

Polypoid lesions of varying extent are found in the gut. Ewing held that there was probably a definite relationship between multiple polypi and the more intense and general form known as intestinal polyposis. Polyposis is found most frequently in the colon and in the rectum more often than in other parts of the large gut. Thorbecke described thirty-four cases; in twenty-three the rectum was

affected, in five the colon and rectum were the seat of the lesions and in six the condition was confined to the colon alone.

Dr. J. F. Erdmann and Dr. J. H. Morris have recently discussed polyposis of the colon.<sup>1</sup> In the first place they refer to the various methods of classification that have been used in connexion with tumours of the gastro-intestinal tract. They point out that adenomata are found with greater frequency in the distal portions of the gut and suggest that the term polyposis of the colon should be used to designate only an adenomatous hyperplasia of the intestinal mucous membrane as opposed to those polypoid tumours of the intestine which are found on histological examination to be fibromata, myomata and so forth. They hold that cases of polyposis of the colon fall naturally into two clinical groups, an adult or acquired type and an adolescent or congenital and disseminated type. The adult form is acquired during adult life and presents itself as a few scattered polypoid tumours closely associated with frank evidence of chronic irritation of the mucous membrane. The second type may become manifest in early youth. Associated symptoms of rectal bleeding and secondary anaemia may occur and more than one member of a family may be affected. The mucous membrane of the colon is thickly and uniformly studded with multiple adenomatous polypi without any obvious aetiological signs. Drs. Erdmann and Morris contend that the obvious difference in the clinical pictures justifies this grouping in opposition to the view that the two types represent merely a difference in the degree of adenomatous hyperplasia. They describe the tumours of polyposis as being composed of two essential elements, a stalk or supporting framework continuous with the sub-mucous fibrous tissue and an epithelial covering continuous with the normal epithelium of the gut. In this mucous membrane subsequent changes occur. Ewing states that the first changes consist of a profuse and pronounced hypertrophy of the entire epithelial lining and he regards this as supporting Versey's view that the sole element in the predisposition is the excessive reaction of the epithelium to irritants. Drs. Erdmann and Morris refer to Ewing's statement that the stroma is the seat of lymphocytic infiltration with the formation of new stroma cells, blood and lymph vessels. They regard the transition from this state of simple thickening to one of sessile or pedunculated tumour formation as a gradual one and assume that it is effected by the mechanical traction exerted by the ever moving intestinal contents upon the areas of thickening. They apparently accept Ewing's findings and state that they have been able repeatedly to demonstrate all morphological gradations from simple polypi through early infiltrative tendencies up to frank and unquestioned adenocarcinoma.

The relationship of polyposis to malignant disease has long been a subject for discussion. Quénu

<sup>1</sup> *Surgery, Gynecology and Obstetrics*, April, 1925.



held that half the cases were associated with carcinoma. The transition in intestinal polyposis of hypertrophic mucosa and papillæ into multiple carcinoma has been clearly traced by such observers as Bardenhauer, Wulf, Verse and Doering. Ewing also states that in certain cases of chronic colitis in young subjects preceding definite polyposis the entire mucosa is lined by definitely hypertrophic epithelium closely resembling *adenoma destruens*, but lacking the heterotopia of a neoplasm. Drs. Erdmann and Morris carry their views to their logical conclusion. They state that the ætiology seems almost to suggest itself as the life history of gastro-intestinal carcinoma is studied. According to them the sequence of irritation, inflammation, reaction, mucous membrane hyperplasia and polyp formation is readily acceptable.

#### PELLAGRA.

A good clinical account of pellagra was given in this journal by Corlette on June 21, 1924. He described fully the skin changes which are found in the condition and discussed its ætiology. He did not describe the pathological changes produced in the various organs for the excellent reason that the disease in his patient followed the more unusual course and the patient recovered.

Some important observations have recently been made on the pathological changes in pellagra by Dr. James Denton.<sup>1</sup> Dr. Denton has based his study on sixteen cases studied clinically and *post mortem* at Panama. Of the sixteen cases he has excluded four from his study, either because one or other of the usual clinical manifestations of the disease was absent or because the lesions of some other disease were found in addition at autopsy. Dr. Denton gives in detail the clinical histories of the remaining twelve patients. In all the essential clinical manifestations were present, skin lesions, lesions of the mouth and tongue, symptoms referable to the central nervous system and gastro-intestinal disturbances such as abdominal pain, diarrhœa, nausea and occasional vomiting. In no instance was death due to intercurrent infection.

Before discussing the autopsy findings in these cases Dr. Denton refers to pathological observations made by other workers. The Illinois Pellagra Commission concluded that the disease is due to infection with some living microorganism and that a possible habitat for the parasite in man is in the intestinal canal. They regarded protein deficiency as a possible predisposing factor. The skin lesions were looked upon as being angio-neurotic in character. Ulceration was found in three cases in the intestine and the tongue lesions were described as being similar to aphthous stomatitis. Singer and Polloch described changes in the central nervous system and distinguished acute from chronic stages. Mills described general superficial necrosis of intestinal epithelium. Dr. Denton points out that Mills made his *post mortem* examination at considerable

intervals after death and thinks that the changes described by him were probably due to autolytic change. His own autopsies were done with two exceptions within a few minutes of death. The gross changes found by him were characteristic. The mucous membrane of the mouth and œsophagus were brownish red in colour and grey areas of necrosis of the epithelium were found. The small intestine was dark red in colour when viewed *in situ*. Colitis was present in every instance. It is pointed out that a readily recognizable colitis can exist without giving rise to clinical symptoms.

The histological appearances were interesting. In the skin rarefaction of the superficial corium was found. Its vessels were dilated. Multiprocessed fibroblasts were seen in the perivascular tissue. The collagenous binding between the epidermis and the corium was destroyed and the lymph channels from the epidermis disturbed; shallow vesicles were found in this situation. The degree of separation is dependent on the severity of the lesion. The telangiectases clearly developed from preexisting capillaries and precapillary vessels by distension. The formation of telangiectases seems to be dependent on imperfect repair of the superficial corium. When the papillary stratum is destroyed, it is replaced by coarse collagen which subsequently contracts and obliterates the angiectases and the epidermal cells lie on a dense and almost avascular corium. Dr. Denton concludes that the skin lesions give no evidence of being infective in nature. The lesions of the tongue, mouth and œsophagus were found to be the most constant and consistent lesions of the disease. Necrosis, inflammatory action, formation of a fibrinous exudate and epithelial reaction were characteristic. The changes in the colon were remarkably constant and all but specific. The most striking features of the colitis of pellagra are changes in the surface epithelium and peculiar dilatation of the blood vessels of the submucosa. Focal necroses were present in the liver in three instances. Dr. Denton did not attempt extensive typographical examination of the central nervous system, but he concludes that the changes found in that system are not in direct proportion to the acuteness and severity of the disease. They appear to him to be more in the nature of a by-product of the disease. Apparently he had some difficulty in finding damaged cells in cortex and spinal cord. Other observers have regarded changes in the central nervous system as essential. In his summary Dr. Denton states that the study of the lesions in pellagra does not give any direct insight into the origin and cause of the disease. The cutaneous lesions are not infective and the lesions of the mouth, tongue and colon are integral parts of the disease. At the same time some underlying and contributory factor must be necessary for their production. The character of the cutaneous lesions would indicate that they are photodynamic effects. The fact that the lesions of the tongue, pharynx and œsophagus are essentially the same, however, prevents the acceptance of this hypothesis. Some other factor than radiant energy must be responsible for the reaction in the skin and mucous membrane.

<sup>1</sup> The American Journal of Tropical Medicine, March, 1925.

## Abstracts from Current Medical Literature.

### BACTERIOLOGY AND IMMUNOLOGY.

#### The Effects of X-Ray and Dry Heat on Antibody Formation.

JAMES B. MURPHY AND ERNEST STURM (*Journal of Experimental Medicine*, February, 1925) report experiments undertaken to investigate the observations of Hektoen and others in regard to the effect produced by exposure to X-rays upon antibody formation. Hektoen, in searching for the location within the body of antibody formation, utilized the fact that X-rays produce a destructive effect on the lymphoid tissues and has shown that antibody formation is restrained in animals exposed to X-rays. He, therefore, concluded that antibodies are formed in the spleen, lymphoid tissues and bone marrow since these are the structures most affected by exposure to X-rays. Murphy and Sturm, in a previous set of experiments, had proved that X-rays deplete the lymphoid tissues without damage to the bone marrow, while dry heat stimulates the activity of these organs. They found that in rabbits who had received three to five daily exposures to X-rays for four minutes (the spark gap being 7.5 centimetres, milliamperes ten, target distance fifteen centimetres), that the amount of lymphoid tissue could be reduced while the bone marrow was undamaged. The series of three to five daily exposures was given prior to or immediately following the first injection designed to elicit antibodies and was repeated weekly. For the stimulation of the lymphoid tissues the rabbits were exposed to dry heat at temperatures ranging from 50° C. to 52° C. for fifteen minutes, one exposure was made before the immunizing injections were commenced and others at weekly intervals. The effects of exposure to X-rays and to dry heat upon the production of precipitating, agglutinating and protecting antibodies were studied. It was found that rabbits exposed to X-rays manifested a deficiency in the production of such antibodies, while rabbits exposed to dry heat developed these antibodies in larger quantities than do untreated animals immunized by the same process.

#### The Isolation in Throat Swabs of the Causative Type of Pneumococcus.

FRANK B. KELLY AND HARRY GUSSIN (*Journal of Infectious Diseases*, October, 1924) recommend the taking of throat swabs for the isolation of the causative organism in patients suffering with pneumonia in preference to the collection of samples of sputum. They claim that the taking of throat swabs disturbs the patient less than the attempt to cough up the tenacious sputum; that sometimes it is not until after the crisis that the

secretion can be easily expelled and that in children it is often impossible to obtain sputum. The method they adopted in one hundred and thirty-six cases of lobar pneumonia was to swab the back of the pharynx and the tonsillar region. The swab was immediately placed in a tube of blood broth containing ten cubic centimetres of plain broth, with a hydrogen ion concentration of 7.8, to which about 0.5 cubic centimetre of sterile sheep's blood had been added. The tube was incubated for four to six hours and about one cubic centimetre of the supernatant fluid injected into a white mouse. At the same time sputum obtained from the patient was washed and injected directly into a mouse. The throat swab cultures yielded practically the same results as the sputum examinations. Contamination with saliva did not seem to interfere in the determination of the type of causative pneumococcus since samples from forty-five patients were injected into mice in washed and unwashed condition and the same results obtained.

#### Titration of Diphtheria Toxin and Antitoxin.

STANHOPE BAYNE JONES (*Journal of Immunology*, November, 1924) gives details of his observations on the use of Ramon's flocculation method in the titration of diphtheria toxin and antitoxin. This method is adopted as a routine procedure at the Pasteur Institute in Paris and the Danish Serum Institute in Copenhagen. It was found to be simpler, more rapid, less expensive and subject to better control than the usual method of titrating toxins and antitoxins by the use of animals. A diphtheria toxin is first standardized by comparison with an antitoxic serum of definitely known unit value. The amount of toxin which will cause initial flocculation with one unit of antitoxin, is determined. This amount is given the symbol  $L_1$  and from it is calculated the number of units of antitoxin to which one cubic centimetre of the toxin is equivalent by flocculation. After the  $L_1$  amount of a toxin has been determined, it serves as a point of reference for the estimation of the value of antitoxins. In carrying out the experiments upon which his observations were based, the author used two cubic centimetres of toxin in each tube instead of twenty cubic centimetres as recommended by Ramon. A Trevan micro-syringe capable of delivering 0.001 cubic centimetre with an error of 1% or a one cubic centimetre tuberculin syringe with graduated barrel six centimetres long was used, the syringe being fastened on a metal frame of a micrometer calliper. The fluid was delivered through a twenty-six gauge platinum needle, the tip of which was ground flat. Clear glass test tubes ten centimetres long with an inside diameter of 0.75 centimetre were used, all the tubes in any series having the same diameter. To the

series of tubes containing two cubic centimetres of toxin were added progressively increasing amounts of antitoxin. The tubes were incubated at 55° C. in a water bath, the water covering half the column of fluid in the tubes. At the end of a certain time the mixture in one of the tubes begins to become flocculant and this mixture was found by tests on animals to be neutral, neither the whole mixture, the precipitate nor the supernatant fluid having any toxic effect upon guinea pigs. The mixtures in the other tubes became flocculant later and these were found to be toxic or antitoxic according as they contained more or less of the antitoxic serum than the amount in the tube which first showed signs of flocculation. The flocculation reaction was found to be specific. No flocculation occurred when normal serum, tetanus antitoxin or any other heterologous serum was added to the diphtheria toxin. Old antitoxic sera, the fresh sera of some immunized horses and pseudo-globulin preparations when concentrated fail to cause flocculation. By mixing these preparations with fresh antitoxic serum it is possible to titrate them by Ramon's method. The author concludes that Ramon's method is particularly useful in the preparation and standardization of toxin and antitoxin and will be a valuable means of advancing investigations as to the nature of toxins and antitoxins.

#### The Influence of the "Diaplyte" Antigen of Dreyer on Tuberculosis in Guinea Pigs.

JACQUES J. BRONFENBRENNER AND ELMER L. STRAUB (*Journal of Experimental Medicine*, February, 1925) state that in their hands the "diaplyte" antigen prepared according to Dreyer's procedure has failed to yield beneficial results. The therapeutic and prophylactic value of this antigen in experimental tuberculosis of guinea-pigs was studied by these workers and in their series the animals treated with the antigen tended in general to develop lesions more quickly and to die earlier than the control animals. They suggest that some differing quality in the vaccine prepared by them may account for the difference in the results or that variations in duration and intensity of treatment may be the cause. The time at which therapy should be instituted is a point still to be investigated, since they noted that those animals which received their first treatment comparatively late after infection, survived longer than those treated early.

### HYGIENE.

#### Occupational Therapy.

ELIZABETH BRODIE (*Archives of Occupational Therapy*, February, 1925) points out that in order to get something of the spirit of play into work,

the work should be pleasing and interesting. Work for the mentally afflicted should be regarded from a therapeutic rather than an economic view point. There are, however, difficulties, such as that of introducing a sufficient variety of work to suit all tastes, the lack of suitable rooms where much work can be carried out under healthy conditions, where materials can be stored and tools kept together. These difficulties may be overcome by the institution of a special occupation department, for then classes are formed where teachers and nurses give individual attention to the backward members. The plan works well for nearly all are interested, even the restless settle down wonderfully to their respective tasks. Not all patients find their interest in the lighter crafts, some prefer the garden, the sewing room, the laundry or the kitchen. The points are that practicability must be the test of all work however idealistic and in the rate-supported institutions, where the economic aspect cannot be disregarded, careful selection with a due regard to the inclination of the individual must be made in order to get help for all departments. Any arrangement which would tend to deprive even one department of its quota of workers, is unwise. In the author's hospital (Glasgow) all the uniforms of the nurses and domestic staff are made on the premises with the help of the patients. The author does not agree with the suggestion that a patient should not be utilized at his own trade, but should be given a change of occupation. She concludes by pointing out that it would seem that with all this labour to command the mental hospitals could be made to contribute more largely to their own support than is at present the case.

#### Intestinal Parasites Among Filipino Food Handlers.

H. A. WYCKOFF AND W. O. FRENCH (*The Journal of the American Medical Association*, April 4, 1925) point out that many of the Filipinos who come to the United States, find employment in the handling of food supplies. In the public institutions some are employed as waiters, as house boys and in the kitchen. A survey of such a group included routine stool examination of direct smears and centrifugized sediments. In view of the high percentage of infestation the authors express surprise that none of the men had any definite symptoms. Of thirty-four persons examined twenty-eight were found to harbour parasites. Twenty-two of these individuals were the subjects of either a double or triple infestation. The parasites found were hookworm in twenty-one instances, trichiasis in sixteen, ascaris in two, fasciolopsis and hymenolepis in one instance each. Protozoa were found in twelve cases. The authors find the percentage of infested Filipinos greatly in excess when they compare it with the incidence of intestinal protozoa in medical patients in the Sandford service.

The number of infestations among hospital and clinical patients was 22%. Among seven thousand patients examined only 4% harboured helminths. Among the Filipinos 72.4% were infested with hookworm and 42.9% with protozoa. While the number of persons examined in the series was small, the authors point out that it indicates a source and dangerous means of spread of animal parasites. The protozoan parasites are particularly apt to be distributed by food handlers. The helminthic parasite must pass a part of its life cycle outside the body of its host and therefore is not so apt to be transferred directly to non-infected persons through the handling of food supplies.

#### Training Colonies in the Treatment of Tuberculosis.

KAY MENZIES (*Journal of the Royal Army Medical Corps*, February, 1925) in discussing training colonies in the treatment of tuberculosis at the Tenth Annual Conference of the National Association for the Prevention of Tuberculosis, pointed out that the training colony was originally evolved as a supplement to the sanatorium. It was founded in order that while under medical supervision the patient might be gradually rendered fit to return to his civil employment or that if the employment were unsuitable he might be trained to take up a more appropriate pursuit. He also discussed the advantages and disadvantages of the two forms of colonies—the vocational training colony and the village settlement. He pointed out that lack of success in these colonies could be attributed to several factors: (i.) Too great ambition in initial outlay, such as purchase of large country houses *et cetera*. (ii.) Failure to select suitable staff, it being of greatest importance to select those who are physically and temperamentally suitable for colony life. (iii.) Failure to recognize that training must be secondary to treatment. (iv.) Absence of an organization to provide a suitable post for every colonist before he leaves the colony. A. Sandison also pointed out the necessity of providing for the dependants or the patient while he is in the colony and emphasized the unfairness of saddling industry with the unremunerative consumptive labourer. J. C. Kennedy then describes a visit of members of the Conference to Burrow Hill Training Colony. This colony is supported by a grant from the Ministry of Health and subscriptions through the agency of the National Association for the Prevention of Tuberculosis. There are three pavilions containing eighty beds. Twenty of these are for patients requiring sanatorium treatment, the remaining sixty are for men who have sufficiently recovered to undertake some occupational work. The colony provides three courses in training which lasts about two years. These are market gardening, light farming and rural carpentry. All the trainees

are pensioners. The trainees complained that life in the colony did not necessarily improve their health, that the nature of the instruction did not fit them to start on their own account when they left the colony, that starting on their own account in the labour market was impossible without capital and, though the Ministry of Health made certain provision, it was inadequate. Kennedy's impression was that complaints could be traced to the following causes: (i.) The feeling of uncertainty as to the future, in some cases amounting to hopelessness; (ii.) the unsuitability of temperament of many to the environment; (iii.) separation from the family.

#### Physical Examination for Flying.

C. F. SHOOK (*The Military Surgeon*, April, 1925) commenting on the definite regulations insuring the continued success of aviation by the protection of its personnel, points out that the most important are the semi-annual physical examinations of flyers and more especially the examination of applicants for flying. During the past three years three hundred applicants have been examined and the author points out that 37% were disqualified because of permanent defects. It was found that pathological conditions of the eyes predominated, a total of one hundred and ten such defects being noted. Second in predominance were physical irregularities of the nervous system. Third in disqualifying factors were diseases of the ear with disease of the nasopharyngeal regions next in number. The least number of defects were found in the examination for equilibrium, when there were only eight disturbances of sufficient degree to call for permanent disqualification. Apart from these specific subdivisions the general physical examination revealed a total of sixty-two causes for rejection. These included increased blood pressure, under-development, insufficient chest expansion, presence of hæmorrhoids or herniæ and previous history of rheumatism, asthma, malaria without a permanent cure. Apart from this physical examination, however, the psychiatric side of the question had to be considered. A man may be physically perfect yet be fundamentally incapable of being a pilot because of a nervous instability; flying makes strenuous demands upon the mental system. It was found that this examination was responsible for many rejections even where the applicants were physically excellent. The author concludes by pointing out that according to reports the Air Service personnel is far superior physically to that of other branches of the service. He regards it as proving conclusively the efficiency of a system whereby an imperfection may be perceived in its first stages and prevented, where human prevention is possible, from developing into a permanent disability and from resulting in the loss of a valuable officer from the active duty of the service.



## British Medical Association News.

### SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at the Walter and Eliza Hall Institute of Research on April 1, 1925, Dr. H. DOUGLAS STEPHENS, the Vice-President, in the chair.

#### Standardized and Progressive Surgery.

Mr. H. B. DEVINE read a paper entitled: "Standardized and Progressive Surgery" (see page 613).

Mr. R. HAMILTON RUSSELL, in opening the discussion, said that in anticipation of a paper on gastric surgery by Mr. Devine, he had looked into the address on this subject given by Mr. Devine to the American College of Surgeons in New York and had consulted other literature until he felt "from the crown to the toe, top-full" of gastric surgery. Mr. Devine, however, had elected to give them a general review of his observations in America and had made it extremely interesting. Mr. Russell recalled having commented in 1914 on the operation of gastro-enterostomy as having raised in the first instance a conflagration which had subsequently settled down into a steady luminous flame. That statement was surely premature for the discussion centring round gastro-enterostomy still possessed many of the attributes of a conflagration rather than a steady flame. In gastric surgery the biochemist and the radiographer played very important parts and it appeared from the remarks of Mr. Devine that the neurologist was about to take his part also. He confessed that he was puzzled by the application of neurology to gastric surgery and in particular did not understand the use of the term "posture" in relation to viscera such as the stomach and bladder.

With reference to the surgical technique of operations on the stomach Mr. Russell urged a more extended study and utilization of the extremely ingenious retractor devised by Mr. Devine. Mr. Devine himself gained great advantage from it in the direction of stability of the field of operation and excellent view. Any surgeon who would master its use, would derive great benefit thereby.

Mr. Russell paid a tribute to the memory of the late Professor J. I. Hunter with whom he had travelled to America. He counted it a great privilege to have been afforded the opportunity of making the acquaintance of John Irvine Hunter in that close intimacy that could be readily developed between passengers on the same ship. John Hunter, one of Australia's greatest men, was at the same time, human, lovable, boyish and kindly.

In conclusion Mr. Russell said that one of his objects in visiting America had been to further the aims seen under formal organization in the English-Speaking Union, the promotion of mutual understanding between the two great English-speaking peoples. He deplored cheap and foolish disparagement of Americans by some who should know better. Anyone who would take the trouble to look thoughtfully at a map of the Pacific and draw a few obvious deductions, would convince himself that the day would certainly come and could hardly be far distant when a close union between the various divisions of the English-speaking family would be found the most potent force for the preservation of humanity's interests that the world had ever seen.

Dr. FRANK APPERLY paid a tribute to the enthusiasm displayed by Mr. Devine in the scientific investigation of the problems connected with gastric and duodenal ulcer. Before going to America Mr. Devine had worked in close cooperation with laboratory workers at the University and in so doing had set a very stimulating example.

Dr. Apperly said that investigation of fifty of Mr. Devine's patients showed that there were certain difficulties or phenomena which interfered with the attainment of an ideal result. These could be appreciated only by a precise knowledge of the sequence of events; this again depended on certain physiological facts. His investigations had shown that certain aspects of gastric physiology

were imperfectly appreciated and as these were essential to the understanding of what he had to say, he would give a brief *résumé* of his findings.

In the first place when food entered the stomach the gastric contents gradually attained a certain total chloride strength and it was necessary for this concentration to be established before evacuation could occur. This final strength of salt was absolutely constant in each individual, no matter what was added to the food or done to the stomach.

Dr. Apperly pointed out that the law held with a salt-free test food or when hydrochloric acid, sodium carbonate or sodium chloride was added to the meal; the same total chloride value was reached finally, when evacuation took place. Moreover, observations made on two patients after unsuccessful gastro-enterostomy, after the gastro-enterostomy was undone and after a third operation of partial gastrectomy showed that under all circumstances the final total chloride value was the same, although acidity varied greatly. Even if salt or acid were added above the final value, dilution occurred until the ultimate correct value was attained.

In the second place each individual had his own final value which was approximately that of the sodium chloride concentration in the plasma.

Thirdly, the stomach would not empty until this value was reached.

Fourthly, in those persons in whom this final value was low, the stomach tended to empty more rapidly than in those in whom it was high.

Fifthly, the total chloride was made up of free hydrochloric acid, combined acid and sodium chloride regurgitated from the duodenum. If a relatively large amount of sodium chloride were regurgitated early in the cycle acidity was low and *vice versa*. It therefore appeared that the amount of hydrochloric acid secreted was dependent upon the amount of sodium chloride in the reflux; if this were increased, the secretion of hydrochloric acid was depressed. Hence one of the surgeon's aims was to promote reflux in order to diminish the secretion of acid and to dilute that already secreted.

From these and other results it appeared that one of the functions of the stomach was to retain its contents until these reached a certain salt strength or osmotic value which would be acceptable to the intestine. If food of less than this value entered the duodenum, the intestine regurgitated it as a potential injurious agent. This alternate passage to the duodenum and regurgitation to the stomach continued until the final salt value was attained when the stomach emptied. This was the biological meaning of the regurgitation of duodenal fluids.

In regard to reflux force regurgitation implied a force operating on the rejected fluid. This was supplied by the intestinal musculature and was elicited by the potential injury, namely the fact that the food entering the intestine was not of the required salt strength.

Dr. Apperly said that he had proved that the measure of the divergence from the normal salt strength was the measure of the reflux force. The reflux force might be

$$k + a$$

roughly stated as:  $R = M - \frac{k + a}{x} + 1$  where  $M$  represented

the total salt strength which it was necessary for the stomach to attain, and  $k$  the sodium chloride strength of the mixed duodenal fluids as secreted;  $a$  was the index of the alkalinity of these fluids and  $x$  the average acidity of the food entering the duodenum at the moment under consideration.

Hence  $R$  diminished with (i.) rise of  $k$  and  $x$  and (ii.) fall of  $a$ . If  $k$ ,  $a$  and  $x$  were known he could calculate the acidity at any moment with a close degree of accuracy.

Speaking from the pathological aspect Dr. Apperly said that after consideration of a large number of cases he would divide dyspeptics into two main classes, those in whom the reflux was excessive and those in whom it was diminished.

When the reflux was excessive, attainment of the required salt strength was difficult or prolonged and regurgitation or rejection from the duodenum continued over an extended period. Secreted duodenal fluids were thereby added to the meal, the bulk of the gastric contents increased and the stomach adaptatively dilated to accommodate the increased mass. There followed hypoaclidity, hypotonicity, slow emptying and a sense of fullness. The appropriate treatment comprised provision against excessive dilution by giving dry food or restricting the intake of fluid with meals and the administration of hydrochloric acid, sodium carbonate or sodium chloride in concentration less than that of deci-normal.

When the reflux was diminished, the required salt value of the gastric contents was reached too soon. There followed early and rapid emptying by the stomach of contents characterized by high undiluted acidity, small gastric volume, after a given time and adaptative contraction of the stomach; acid entering the duodenal bulb was not neutralized, lay there and provoked pyloric spasm and pain. This type was distinguished by hyperacidity, hypertonicity and early rapid evacuation such as was observed in a characteristic manner in duodenal ulcer.

Dr. Apperly indicated that he had proved by experimental observations in many duodenal ulcer patients that all displayed a high sodium chloride concentration in the mixed duodenal fluids as secreted (high *k*) and a low degree of alkalinity in these fluids (low *a*).

"High *k*" and "low *a*" appeared to depend on a state of acidosis since he had found in patients exhibiting these conditions that there was a difficulty in alkali output, a high reading for the blood chloride and elevation of the blood sugar. It was the intention of Dr. Gordon Cameron and himself to investigate the truth of this supposition by determining the hydrogen ion concentration of the blood and the carbon dioxide combining capacity of the blood in patients suffering from duodenal ulcer.

In the course of some remarks on the treatment of duodenal ulcer, Dr. Apperly said that therapeutic measures should be directed towards the neutralization of free acid (i.) in the stomach and (ii.) in the duodenal bulb. It was important that the free acid present in the stomach at the end of gastric digestion should be counteracted as this acid later entered the duodenal bulb and remained there producing spasm, ulceration and pain. He had nothing to add to the measures already in practice for the neutralization of free acid in the stomach. For neutralization in the duodenal bulb these measures might be supplemented by the adoption of means of promoting the duodenal reflux. He had lately tried the medical effect of the emetic drugs in small doses in this direction, but as yet his experience of them was limited. The reflux was promoted surgically, by the operations of gastro-enterostomy and partial gastrectomy.

He regarded gastro-enterostomy as a mechanical device for utilizing the expulsive force of the stomach in driving fluids and alkalis into the duodenal bulb and not as a drainage operation. When the stomach force was poor, as in organs of low-toned flabby musculature, an unsuccessful issue of gastro-enterostomy was to be anticipated.

Partial gastrectomy was more rational because the passage of fluids of high sodium chloride content to the stomach was facilitated. As he had demonstrated on the blackboard, when the sodium chloride curve was high the secretion of hydrochloric acid was diminished. In these circumstances the required salt value was readily and quickly reached and rapid emptying of the stomach was promoted.

Failure to produce a fall in acidity occurred when the total salt strength of the gastric content (*M*) was greater than that of the mixed duodenal fluids as secreted (*k*). Secretion of acid continued until *M* equalled *k* plus free acid (*f.a.*). Under such conditions no operation could lower acidity and treatment must be directed towards correcting the general acidosis and the removal of possible causes such as septic foci.

Dr. Apperly said that he was not impressed with the prospect of success in the operation of dividing the autonomic nerve fibres. He regarded the operation as wrongly

based since tone was so largely a secondary phenomenon. Tone depended on gastric volume, and gastric volume on the ability of the stomach to reach *M* and *M* was that total salt strength which must be obtained before the gastric content was acceptable to the duodenum. Tone also depended partly on the blood sugar and this again on a general state of acidosis or the reverse.

Mr. R. C. Brown said that he was particularly interested in Mr. Devine's operation of partial gastric exclusion as a surgical measure in the treatment of gastro-duodenal ulcer. There was no doubt that by the complete cessation of functional activity of the parts distal to the line of incision the diseased portion was placed at rest and the surface of the ulcer, no further irritated by acid contents, in ideal circumstances for healing without liability to recurrence.

The increasing alkalinity of the gastric content as the line of stomach section approached the cardia was an important factor in diminishing the liability to recurrence. In the operation of Roux the duodenal flow was passed into the intestine much below the jejunal union with the stomach and could not be expected to regurgitate in an antiperistaltic direction or affect the reaction of the stomach contents. He had not heard that jejunal ulcer was especially common after the "Y" operation and if alkaline regurgitation was not necessary for a good result with that procedure, why should it be so in the operation of gastric exclusion?

Mr. Devine's operation appealed to him as filling a gap in the treatment of those ulcers in which the results of gastro-enterostomy were not all that could be desired and gastrectomy seemed too radical. Gastric exclusion appeared worthy of an extended trial.

SIR GEORGE SYME said that he was considerably perplexed by the problems under discussion. Although Dr. Apperly had put the chemical and physiological aspects very lucidly he could not follow their application as clearly as he could wish.

The question of duodenal reflux had been introduced as between gastro-enterostomy and gastrectomy. Mr. Devine's operation of gastric exclusion gave better practical results than either and according to the analyses made by Dr. Apperly it was attended by a better chemical result also. The good chemical result was stated to be due to an increased reflux, but in the operation of gastric exclusion the stomach was cut off from the duodenum altogether. Under these circumstances, with the contracting musculature of the stomach operating on a wide stoma into the jejunum, he could not see how the beneficial result could depend in any way on the reflux.

If the question were entirely one of chemistry and the adjustment of the formula of the gastric content, why was medication by the mouth such a failure and why should it be necessary to operate to bring about a purely chemical result? Mr. Devine had pointed out that there was a missing link in the chain of reasoning and that it might be supplied by the neurological factor; this was very probable, but had yet to be proved.

All the explanations advanced only drove them further and further back. Why should the neurological control be defective? Why should there be a deviation from the normal in respect to acidity and chloride content of the gastric secretion and why should ulceration be associated with certain toxic conditions and not with others?

He was quite satisfied that the best surgical procedure was Mr. Devine's operation of gastric exclusion; it was the most rational and in his experience had yielded the best practical results.

It was a matter of great regret to him that in all his long experience he had never elucidated in any way any of the problems surrounding gastric ulcer. Mr. Devine's example in calling together a team of workers and inspiring and assisting research work was worthy of the highest commendation.

Mr. Devine had referred to colon surgery. He (Sir George Syme) had always been very interested in this subject, but had never been satisfied with his operative results and for a long time felt somewhat humiliated that they had not been better. From Mr. Devine's remarks

and from recent reports on the subject it appeared that perfection in operative results was seldom attained.

There was no doubt that the mortality attending what was in other respects the ideal operation for carcinoma of the recto-sigmoid, was very high, even in capable hands. The two or three stage procedure gave the best results in the long run in respect to low mortality and comparative freedom from recurrence.

Mr. H. B. DEVINE in reply said that he would have been very pleased to have confined his remarks to gastric surgery, but that he considered that a general account of his observations on his recent visit to America would perhaps interest the greater number.

The evolution of the operation of partial gastric exclusion had been an extremely interesting study. Originally he used to divide the stomach close to the pyloric musculature, but he found that the acidity subsequently was very high. As the incision of the stomach was moved towards the cardia the operation became simpler of performance and the results improved. It might be said that the effect varied from inch to inch; the acidity went down as the cut went over. The operation as now performed achieved all the effects of gastrectomy and there was no bother with recurrent ulcer. He had been informed by W. Mayo and by Judd that they considered gastric exclusion as particularly well adapted to the treatment of bleeding ulcers and chronic duodenal ulcer.

Dr. Apperly and himself were at variance in theory and in explanation of some of the bad results. He was very interested in Dr. Apperly's work, but could not entirely agree with him in the interpretation of some of his findings.

Mr. Russell had made reference to the late Professor Hunter. John Hunter was truly a fascinating personality. His conception of the involuntary muscle mechanism as complementary and not balanced and as essentially the same as that of voluntary muscles, simplified many physiological and surgical problems. The subject of incoordinated muscle action was extremely interesting and attention should be focussed upon it.

Dr. F. L. APPERLY said that he did not deny the possibility of perversion of the neuro-muscular mechanism, but that he considered it at the most as secondary to the factors discussed in his earlier remarks. There was evidence that hyperacidity was due ultimately to a systemic acidosis, in which condition the readings for both blood chloride and blood sugar were high, as he had been enabled to show by his own observations. It had lately been demonstrated that gastric tonus increased as the blood sugar rose. It followed that hyperchlorhydria and hypertonus were co-results of acidosis rather than that hyperchlorhydria was due to hypertonus.

Chemical treatment by mouth had been a failure. One factor contributing to lack of success in hyperchlorhydria had been that alkalis administered *per os* were as a rule given in too great concentration, with the result that the general salt value of the gastric content was raised to a point beyond that at which it was acceptable to the duodenum. Under these conditions duodenal regurgitation ceased. The drugs should be given in very dilute form; indeed, as was the practice of Warbasse, water only might be given with greater advantage than too strong alkali.

He regarded gastro-enterostomy as a mechanical device for utilizing the expulsive force of the stomach in driving fluids and alkalis into the duodenal bulb and not as a drainage operation. Relief of spasm and pain followed the neutralization effected in the bulb.

#### MEDICO-POLITICAL.

THE Council of the Victorian Branch of the British Medical Association at a recent meeting resolved:

That the ethical rule, Number Fourteen, adopted by the Federal Committee and also by the Victorian Branch shall not apply to resident medical officers of the Melbourne Homeopathic Hospital who are members of the British Medical Association.

The Council calls attention to the fact that appointments have been made in accordance with this resolution. They wish to advise our readers that graduates of any Australian university may accept appointments as resident medical officers at the Melbourne Homeopathic Hospital.

The "Principles of Medical Ethics" of the Federal Committee dealing with this subject are:

It is unethical for a member of the British Medical Association in Australia:

1. To designate his practice as based on an exclusive dogma, such as that of homœopathy, osteopathy *et cetera*.

14. To administer anæsthetics for unregistered dentists or any unqualified person.

16. To meet professionally in consultation, as assistant or in any way any practitioner who has been adjudged by the local Branch to have violated any of the above principles.

#### NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Anderson Stuart, Bouverie Primrose, M.B., Ch.M., 1923 (Univ. Sydney), c.o. Perpetual Trustee Company, Limited, Sydney.

Maddox, John Kempson, M.B., Ch.M., 1924 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Trainor, Desmond Coleman, M.B., Ch.M., 1925 (Univ. Sydney), 26, Campbell Street, Waverley.

Yeldham, Alan Edwin, M.B., Ch.M., 1924 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

THE undermentioned have been elected members of the South Australian Branch of the British Medical Association:

Harbison, Ernest John, M.B., B.S., 1924 (Univ. Adelaide), Adelaide.

Howley, Edward Joseph, L.R.C.P. (Edinburgh), L.R.C.S. (Edinburgh), L.F.P.S. (Glasgow), 1914, Wudinna.

Swann, Eric John, M.B., B.S., 1924 (Univ. Adelaide), Adelaide.

#### NOTICES.

A MEETING of members of the New South Wales Branch of the British Medical Association interested in the history of medicine and in medical literature took place on April 1, 1925, at the B.M.A. Building, 30 to 34, Elizabeth Street, Sydney, for the purpose of forming a section of the Branch. It was resolved to form the Section and to call it the Section of Medical History and Literature. Dr. R. Scot Skirving was elected President; Dr. W. Vicars, D.S.O., Honorary Treasurer; and Dr. H. M. Moran, Honorary Secretary. The first meeting of the Section which has received the recognition of the Branch Council, will be held on June 26, 1925, at the B.M.A. Building, 30 to 34, Elizabeth Street, Sydney. Dr. R. Scot Skirving will read a paper on "Gilbert Blane"; Dr. N. J. Dunlop will read a paper on "Captain Cook and the Medical Harbingers on the *Endeavour*"; Dr. W. J. Stewart McKay will read a paper on "Telegony."

The subscription to the Section is five shillings. Medical students will be admitted as honorary members.

A MEETING of the Section of Surgery of the New South Wales Branch of the British Medical Association will be held at the Biological Department of the University of Sydney on June 17, 1925, at 8 o'clock in the evening. The



subject of discussion will be "The Present Position of Cancer Research." The speakers will be Professor F. P. Sandes, Professor H. G. Chapman and Professor A. N. St. G. H. Burkitt.

## Public Health.

### INDUSTRIAL HYGIENE.

DR. CHARLES BADHAM, Medical Officer of Industrial Hygiene in the Department of Public Health, New South Wales, has issued a report of an investigation made by him into the health and factory conditions of certain textile workers. The investigation was commenced on November 20, 1923, and continued until the middle of February, 1924. During this period he examined one hundred and six males and one hundred and sixty-six females at three of the mills. He also conducted a series of inspections and recorded the temperatures and katablometer readings in eight mills in the vicinity of Sydney. Dr. Badham has placed the mills inspected in two classes. In mills of Class I, the manufacture of "tops" by the dry process is not undertaken. The number of employees engaged in processes incidental to these mills are 393 males and 689 females. Of the males 286 are adults and 109 juveniles. The number of females is composed of 425 adults and 264 juveniles.

In mills of Class II, the manufacture of "tops" by the dry process is undertaken. This process requires a high relative humidity of from 50% to 70%, together with a moderately quiet atmosphere. There are only two mills of this class; in one eighty females are employed and in the other fifteen. No figures were forthcoming in regard to males employed in these two mills. All the employees in a given mill were not examined; in one instance examination was confined to every second male or female as the names appeared on the pay-roll, excluding those who had seen but little service at the textile trade. At one mill in which humid conditions were necessary, all the female employees available were examined; four or five either refused examination or submitted to only a partial examination. The medical examination consisted in obtaining a full industrial and social history, an account of past illnesses and of loss of time caused by illness during the previous year. The examinee was measured, weighed and his or her eyesight was tested. In addition the blood pressure and the percentage of hæmoglobin in the blood were estimated.

Examination of juveniles was confined to a few in the spinning section. The reason for this was that the length of service is generally so short and the turnover of employees so large that it was felt that more useful results would be obtained by the investigation of the temperature and air movement in the spinning section. It is interesting to note that of 268 persons employed in the spinning department, 75% (201 persons) had been employed for under one year. Of these 201 persons 52 or 25.9% had been employed for under one month.

#### Results of Examination of Employees.

Dr. Badham's general conclusions in regard to textile mills may be summarized as follows. The health of female employees of mills in Class I, manifested little deterioration that could be explained by the nature of their work. While the health of the male employees in mills of Class I, showed considerable divergence from the normal and from what is thought to be the health of the male members of the labouring community, the divergence could not be shown to result from the nature of the work, except in certain minor affections. The opinion is expressed that more satisfactory ventilation is required in the spinning and weaving sections. The health of the majority of the female workers in mills of Class II, was found to be affected by the conditions of labour. It was concluded that the regulation of the temperature, humidity and air movement in these mills was unsatisfactory and required

considerable improvement. In regard to the sanitation Dr. Badham states that all pan closets should be made fly-proof.

#### Results of Examination of Male Employees: Mills, Class I.

A summary of the findings in the medical examination of one hundred mill employees in mills of Class I, is given. Twenty of these males had been employed in textile mills only, eighty had been previously employed in other industries. Of the hundred men examined those who were quite healthy or free from any minor defects numbered thirty-five. These together with five who suffered from uncomplicated hernia, were regarded as possessing a normal state of health. Renal disease was present to a varying extent in 22%. A catarrhal condition of the nasopharynx described as rhinitis was present in 8% and 5% of the men were the subject of cardiac disease. Dr. Badham states that the very high proportion (14%) found to have definite renal disease is remarkable. He tries to find a reason for the high incidence. Six of the men were over forty years of age and eight had worked longer at other trades. He takes it for granted that the criticism may be made that these figures are obtained from the examination of too small a number of men. He points out that they represent half the male employees of one mill with over a year's service and of dye-house employees of another with some of the carders and tuners. He refers to the figures for 3,967 miners, published by Chapman and Smith for manual labourers at Broken Hill, where it was found that 4.2% had albuminuria. About half of this number were considered to belong to the class of those suffering from physiological or functional albuminuria. Probably the incidence of arterio-renal disease will in his opinion always be found very high amongst factory workers in mills where the work is comparatively light, such work attracts men who are more or less broken in health and are aged and unfitted for heavy toil. The death rate from arterio-renal disease suggests a heavy incidence among the population. Dr. Badham can find no other reason for the high incidence of arterio-renal disease among the workers whom he examined. He gives a table showing the age distribution of the twenty-two men to whom he refers. These men may be more or less "broken in health" and "unfitted for heavy toil," but they can hardly be regarded as aged. Eleven of the twenty-two were not twenty-five years of age, sixteen were forty and under. The twenty-two men were divided into four classes. Men in Class I, numbering eight, suffered from albuminuria with no chronic evidence of nephritis. Men of Class II, numbering five, suffered from albuminuria with increased blood pressure suggesting arterio-sclerotic changes and nephritis. Men of Class III, numbering four, suffered from albuminuria with a history of scarlet fever suggesting definite nephritis. Men of Class IV, numbering five, suffered from albuminuria with evidence of chronic nephritis. Three of those in Class IV, were under twenty-five years of age. No statement is made in regard to what constitutes the evidence of chronic nephritis and no indication is given as to the adoption or otherwise of microscopical examination of the urine. Under the heading of rhinitis Dr. Badham states that 8% of the men examined complained of a catarrhal condition which they considered to be due to the inhalation of wool fibres. A few of the men appeared to have a moderate amount of discomfort from this condition. This complaint is said to be more common among workers in the cotton mills where in the presence of a hot and humid atmosphere it leads to definite changes in the mucous membrane of the nasal fossæ. Dr. Badham holds that this seldom leads to anything more serious than some lowering of the individual's resistance to infection of the respiratory tract. He thinks that this grievance can be remedied only in part. Exposure to wool fibres in this industry is almost essential with the machinery at present in use. Better control can be maintained for certain mixing, devilling and cutting machines.

In spite of the fact that 60% of the males examined were not in good health, the time lost as a result of illness (7.97 days) is comparatively low. It is claimed that this figure should be reduced by discounting accidents met with in the course of employment.

*Results of Examination of Female Employees: Mills,  
Class I.*

The summary of the findings on medical examination of sixty-seven female weavers in textile mills of Class I. is given. Of these fifty-five had been employed in textile mills only and twelve had been previously employed in other industries. Only sixty-seven out of a total of 251 weavers were examined.

In regard to the menstrual history of the women examined it is pointed out that six had reached the menopause. Of the sixty-one who menstruated, thirty-one had no menstrual disability. Six lost a certain amount of time each month. Five lost one day and one lost two days; four lost time occasionally. Ten of the weavers examined had children. Four women gave a definite history of rhinitis. Two of these had worked for fifteen and ten years respectively in cotton mills in England. They regarded the onset of their disability, however, as having occurred in Sydney. Two women gave a history of frequent colds associated with rhinitis. Two women were found to be anemic, the hemoglobin value of their blood being reduced to 60%. One of these women was regarded as possibly exhibiting early signs of tuberculosis. Two women were regarded as suffering from nephritis; their ages were thirty-three and forty-six. Seven women gave evidence of neurasthenia. In the case of one woman the condition was caused by overwork. It was thought that the seven cases of neurasthenia were probably due in part to the lack of proper air movement in two of the sheds examined. The only weavers who objected to the noise of the looms, were two who gave evidence of neurasthenia and one whose nervous temperament quite unfitted her for work at any machine. Some weavers said that the noise soothed them. Dr. Badham expresses an opinion that in the long run such a noisy occupation must tell on the nervous system. Several weavers with anemia, debility and flat-foot were obviously handicapped in their work and would be benefited by change of occupation. It is doubtful whether the onset of their trouble was caused by work in the weaving shed. The work of a weaver is moderately strenuous, particularly if she has to attend two looms. Piecework makes the labour more strenuous and requires a healthy girl or woman. Inherent defects of health will soon be revealed by this class of work and the opinion is expressed that the health and condition of the work will be conserved by better conditions in the weaving machines. Although only a small percentage of the women employees was examined, it was thought that this percentage was more strenuously engaged than many of the others. It is also pointed out that twenty-five of the weavers examined had worked in Great Britain, many of them in cotton mills "in which conditions adverse to health commonly occur."

*Medical Examination of Females: Mills, Class II.*

A summary is given of the findings on medical examination of eighty females employed in textile mills of Class II.. All these women were under forty years of age, four were over thirty and thirty-two were under twenty years. The average age was 25.5 years. The average time lost through sickness during the preceding 12 months was 8.33 days. Twenty-eight women lost no time at all. On inquiry into the menstrual history it was found that sixty-four of the women lost no time at all owing to menstrual disability, one lost two days a month, eight lost one day only and seven lost time occasionally. Thirteen of the female employees had children and twelve of them took a share in looking after the children. Investigations of the renal system was unsatisfactory. The urine of forty-five only among the eighty women was examined. When albuminuria was found, it was impossible to obtain catheter specimens. Three women were suffering from neurasthenia and complained of general weariness, headache, loss of appetite and dyspepsia. One woman suffered from anemia and debility following a miscarriage. Thirty-four women were placed in a class designated "undue fatigue." The diagnosis of this condition rests chiefly on the story of the patient, but can be controlled by critical observation of the patient and cross-examination concerning the quality and duration of such com-

plaints as headache, tiredness and loss of appetite. At the same time it is pointed out that this examination was made during a spell of hot, dry, westerly weather and that doubtless this factor helped to increase the list. Hot conditions are prevalent in this factory and when the heat is less the relative humidity will be greater. For some two hundred days in each year the temperature would mostly be in the vicinity of or above 80° F., that it would often approach 90° F. and that these temperatures would go with a high wet bulb reading and a still atmosphere. It is pointed out, moreover, that there are two instrumental readings available to go towards showing that this group is not a fictitious one. In the first place it was found that the average blood pressure of women in this group was ten millimetres of mercury lower than that of the women classed as healthy, while the average age was practically the same. In the second place a higher proportion of the women in the "undue fatigue" group manifested rises in temperature than those who were labelled "healthy." Dr. Badham states that this raises the whole question of acclimatization. There is in his opinion no doubt that this question is a very real factor to be noted when considering the effect of high temperatures on factory workers. He concludes that not even the fact that many workers will become acclimatized in time to adverse conditions should satisfy those who hold to the view that it is unnecessary to conform to reasonable standards of wet and dry bulb temperatures and air movement.

*Temperature Humidity and Air Movement in Textile Mills.*

As stated before, the mills investigated were divided into two classes. In mills of Class I. were those engaged in the manufacture of "tops" by the ordinary process or the manufacture of yarns or fabrics or of all these products, worsted or woollen, and requiring neither a high degree of humidity nor a small degree of air movement. In mills of Class II. where those engaged in the manufacture of "tops" by the dry process requiring high relative humidity from 50% to 70% and a fairly quiet atmosphere. Two mills are included in this class. In the mills of the first class the temperature of the various sections where females are employed should not in Dr. Badham's opinion exceed the outside temperature by more than one or two degrees nor should the air movement be deficient when the external air movement is good. Unfortunately but a few sections of the various mills come up to this standard and these were generally in the more recent buildings. The worsted spinning departments were usually the most deficient. This is due in a great part to the large amount of horse-power required to operate the spinning frames with their numerous bearings. Dr. Badham advises a more rigid enforcing of the regulations of the *Factories Act* regarding factory temperatures. He holds that an improvement could be effected by such means as the lining of iron roofs, the provision of an effective air-insulating space and the external white-washing of roofs. He states that the heat-producing machines should be separated from the other sections. On inquiry from the Weather Bureau Dr. Badham found that there are two hundred and three days in each year on which the temperature in Sydney might be expected to reach or exceed 70° F.. It should be noticed that throughout his report Dr. Badham has used the Fahrenheit scale and expressed air movement in terms of feet per minute. In our account of his report we are departing from our usual custom and using these units of measurement as employed by him, although they are neither convenient nor rational. In regard to the mills of Class II. the problem was more difficult. In these mills the external humidity would be sufficient for their operations if the temperature of the factories did not exceed the external temperatures, but in these mills it is usually held to be necessary to increase the relative humidity by the use of humidifiers. These instruments send fine sprays of water into the air of the factory. In order to keep the air free from movement and to prevent the dispersion of the humidified air, but little exchange with the external atmosphere is allowed. With no free exchange of air the temperature of the mill is generally in the vicinity of 10° above the outside tempera-

ture. An exception to this is seen during the dry westerly winds, for when the external temperature has a relative humidity of less than 50%, the evaporation of much water in the mills brings down the temperature to approximately that of the external atmosphere. From a medical point of view high degrees of relative humidity are not necessarily objectionable, provided that the wet bulb reading does not exceed 75° F. and provided that there is a reasonable air movement. The problem of securing the necessary humidity for these mills and at the same time preserving a reasonable temperature and air movement does not appear to receive much consideration. Dr. Badham states that the present methods are objectionable and call for alteration. He holds that the various mechanical means are available and that the machinery suitable for this apparatus should be installed. The regulations of the *Factories Act* regarding the use of a humid atmosphere have not been enforced in these mills.

In regard to the air movement in mills Dr. Badham has drawn up a tentative standard of dry kata-thermometer readings. They are shown in the accompanying table.

PROPOSED STANDARD OF DRY KATA-THERMOMETER READINGS FOR VARIOUS TEMPERATURES.

| Air Temperature<br>(Fahrenheit). | Cooling Power<br>(Kata-Thermometer Readings). | Air Movement<br>(Feet per Minute). |
|----------------------------------|---|------------------------------------|
| 70°                              | 5   | 19                                 |
| 71°                              | 4.9   | 22                                 |
| 72°                              | 4.8   | 22                                 |
| 73°                              | 4.7   | 25                                 |
| 74°                              | 4.6   | 28.2                               |
| 75°                              | 4.5   | 31.6                               |
| 76°                              | 4.4   | 31.6                               |
| 77°                              | 4.3   | 35.2                               |
| 78°                              | 4.2   | 39.1                               |
| 79°                              | 4.1   | 47.3                               |
| 80°                              | 4   | 51.7                               |
| 81°                              | 3.8   | 51.7                               |
| 82°                              | 3.6   | 56.3                               |
| 83°                              | 3.4   | 56.3                               |
| 84°                              | 3.2   | 61                                 |
| 85°                              | 3.0   | 61                                 |
| 86°                              | 2.8   | 66                                 |
| 87°                              | 2.6   | 66                                 |
| 88°                              | 2.1   | 71.2                               |
| 89°                              | 2.2   | 76.6                               |
| 90°                              | 2.0   | 88                                 |

From his observations Dr. Badham regards his standard as reasonably practicable with natural ventilation. He states that it takes into account the varying temperatures of the Sydney climate. He recognizes that the standard is not on a high plane and that better conditions should be aimed at; these "could not reasonably be required in some factories and might necessitate extensive use of mechanical apparatus to attain." This is a statement which is open to question. It might reasonably be asked whether hygienic conditions should not be required in factories even though the proprietors have to install expensive apparatus. The regulations exist and are not carried out. This surely is a matter for investigation by the health authority.

#### The Dust Hazard in Woollen Textile Mills.

Dr. Badham reports that adequate precautions are not taken to guard against the dust hazard in woollen mills. He recommends that the wool from the deburring machine should be received in an enclosed space until the wool and dust have settled. In the process of carding a good deal of fluff is carried into the air. This can be prevented to a certain extent by covering the carding machines as is done in the Soldiers' Mill at Geelong. It is strange that Dr. Badham does not think that the use of these

covers can "reasonably be required immediately." In the process of mixing the wool preparatory to the carding operation it is teased in a machine and blown into an open space; here the employees who put the product in bags, frequently work in a cloud of falling wool. In Dr. Badham's opinion the wool should be allowed to settle before it is put into bags. In most instances it can be blown into an enclosed space. When cotton is mixed with wool and is present in a proportion of 20% to 30% of the mixture, precautions are more necessary, as cotton fibres are considerably more irritating to the respiratory tract than wool. The same recommendations are made in regard to the Garnet machines and devilling machines and the machines known as "shakers." The machines known as cutters which remove the fine nap from the material, should be cleaned twice daily or should be fitted with an exhaust fan.

## University Intelligence.

### THE UNIVERSITY OF WESTERN AUSTRALIA.

At a meeting of Convocation of the University of Western Australia held on May 22, 1925, it was announced that Dr. Roberta H. M. Jull had been elected Warden of the University for the ensuing year. The medical profession holds a very strong position in the University. The Honourable Athelstan J. H. Saw, O.B.E., is the Chancellor and now Dr. Jull has become Warden. Dr. Jull may be assured that the medical profession rejoices that she has been selected to fill so important an office and congratulates itself very heartily.

## Congress Notes.

### INDUSTRIAL HYGIENE.

THE Fourth International Medical Congress of Industrial Accidents and Diseases will be held at Amsterdam from September 8 to 12, 1925. A British committee has been formed under the presidency of Sir Thomas Oliver, of Newcastle University, and vice-presidency of Professor E. L. Collis, of the Cardiff University. Jonkheer R. de Marees Van Swinderen is Honorary President of the committee and Dr. H. Menko (2, Grosvenor Gardens, Cricklewood, London, N.W. 2) is the Honorary Secretary. The members of the committee are: Dr. D. A. Coles, Sir William Collins, K.C.V.O., Professor J. Glaister, Sir Kenneth Goadby, K.B.E., Sir William Hale-White, K.B.E., Sir Robert Jones, K.B.E., C.B., Dr. J. R. Kerr, C.B.E., Dr. A. Mercer, Dr. Howard Mummary, Dr. A. Scott, Dr. C. S. Thomson, Dr. Theodore Thompson, Dr. A. Trimble, Dr. H. M. Vernon, Dr. Thomas Watts, M.P., and Dr. R. Prosser White.

A preliminary programme has been issued and it has been announced that eminent authorities in industrial hygiene will contribute papers and take part in the discussions. On the first day the morning will be taken up by a plenary session. The subjects include accidents and diseases from a medical point of view, the diagnosis of occupational diseases, accidents and diseases from a medico-legal point of view, the reinstatement of permanently and partially disabled workmen, accidents and tuberculosis. In the afternoon the sections will be in session. The most attractive subjects down for discussion are trauma and tuberculosis, pneumoconiosis and work in overheated and damp atmospheres.

On September 9, fractures, gas poisoning, nervous and mental diseases and the settlement by the payment of lump sums of small claims, will be discussed in the sectional meetings. The afternoon will be reserved for the reading of papers on industrial accidents, industrial diseases and the achievements of industrial legislation and hygiene.



On September 10 the subjects for discussion will include traumatic affections of joints, the choice of occupation or trade, abdominal injuries and eye affections.

The members will go into plenary session on the last day, when the chief theme will be the question of fatigue.

Apart from the scientific work of the congress there will be social and other attractions. The Municipality of Amsterdam and the Minister of Labour of Holland will hold receptions. The congress dinner will take place at Scheveningen. Excursions are being planned to the harbours and environs of Amsterdam. The ladies' committee is preparing an elaborate programme.

The British committee announces that tickets will be issued for fifteen pounds to include admission to the Congress, a return ticket from London available for one month, a bedroom with breakfast at one of the leading hotels in Amsterdam, admission to the Congress dinner and to the official receptions. Further information will be published at a later date.

## Correspondence.

### THE CANCER CAMPAIGN: TWO SUGGESTIONS.

SIR: Your "leader" on cancer research of May 16 moves me to make two suggestions which may be worth considering.

Firstly, there may be many of the laity and some few medical men who, like myself, have strong objections to animal experimentation. Not a few regard it as an immoral exploitation bound for that very reason to cause ultimately (though in subtle, indirect ways which evade notice) far more world-misery than the knowledge gained alleviates. Nevertheless many such objectors would gladly help the Cancer Campaign provided their donations could be earmarked for activities in the research which in no way involved nor promoted vivisection. For instance, such folk could conscientiously subscribe to forward statistical investigation, a wide branch of research and very possibly the most fruitful of all. Why not, therefore, divide the cancer fund into two parts, a general fund and a special fund proclaimed "non-vivisectional." Probably many would then subscribe to this latter who now will hold back in horror from the whole thing. Just this very procedure was, I believe, adopted in regard to the "Save the Children Fund," to meet the wishes of those who specially preferred or specially disliked helping some one particular nation.

Secondly, I venture to suggest one particular line of statistical investigation and to give my reasons for thinking it may be fruitful. It has been widely asserted, I believe with truth, that non-flesh eaters are very markedly immune to cancer. For instance, large communities of India and equally communities within the Roman Catholic Church who are teetotal and lacto-vegetarian have thus proved immune, so it is said. Now, there seems a sufficiently scientific rationale behind this to encourage further statistical investigation along this line.

One of the outstanding results of cancer research, so far, is that tissue irritation, whether caused by foods, chemical preservatives of foods or in other ways, is an intimate and important causal factor in cancer. It might be a valuable piece of research to determine whether any causal nexus could be established between cancer incidence and intestinal fermentation as evidenced by the degree of offensiveness of the excreta. Strong scent means powerful irritation of olfactory nerve-endings; the same substances, absorbed from the bowel (especially in chronic constipation) would cause tissue irritation which might express itself in various ways (eczema *et cetera*), but would certainly predispose to if not cause cancer. Realizing how extraordinarily powerful (and therefore irritant) are these putrefactive scents and how widespread and severe is constipation in our day, among women especially, it is no straining of the imagination to associate cancer and long-standing bowel absorption, as above. Certainly it is

a definitely observable fact, that when a man changes from flesh eating to vegetarianism, especially if he eschews mouldy cheese, cabbages *et cetera* and does not eat many eggs, his excreta becomes almost odourless.

Yours, etc.,

"OPTIMIST."

Undated.

### STRICTURE OF THE URETER.

SIR: Mr. Bridge in his most interesting paper, April 25, 1925, states "I am satisfied that dilatation is the fundamental part of treatment" of chronic pyelitis "not chemical irrigation." A search through the chronic cases in out-patients at the Women's Hospital will always reveal a number of chronic pyelitis cases, often of long duration. For some years I have been treating these cases by washing the pelvis of the kidney with silver nitrate (2%) with good results. A recent case has converted me to Mr. Bridge's view.

A woman, aged fifty-five, had been treated for three years for chronic pyelitis. The right kidney only was affected. I decided to wash out the pelvis in the usual way, but the only catheter that I had with me, turned out to be blocked after it had been passed. To my surprise she improved as rapidly as if I had washed out the pelvis. The ureter was dilated on two occasions and now six months later she appears permanently cured. The explanation of this seems to be that I have always used a small direct vision Kelly cystoscope, through which I have always used a large ureteral catheter. I have been dilatating the ureteral stricture. Incidentally it explains why I have been optimistic about the results of washing the pelvis of the kidney in chronic pyelitis with silver nitrate, the pessimists used small catheters.

Yours, etc.,

M. G. CUSCADEN, M.D. (Melb.), F.R.C.S. (Edin.),  
Senior Assistant Surgeon,  
Women's Hospital, Melbourne.

55 Collins Street, Melbourne,  
April 27, 1925.

### THE MECHANICS OF RESPIRATION.

SIR: Dr. C. G. McDonald is quite right in stating that I misunderstood his views upon the causation of arching of the palate in cases of adenoids and I was glad to see his very lucid letter in your issue of May 30.

Although I can now see what his theory is, I am unable to agree that it is more likely to be correct than the one I previously described. Briefly his theory may be summed up thus. Adenoids produce narrow anterior nares and mouth breathing. Respiration produces a pressure lower than atmospheric in the nose during inspiration and thus the intraoral pressure becomes higher than the intranasal and the palate is pushed up. If no postnasal obstruction existed I would be willing to admit this, but it must be remembered that the train of symptoms have been initiated by adenoids and it seems to me highly improbable that the anterior nasal obstruction secondary to these will ever approach anything like the posterior, unless the adenoids atrophy or are removed. Further, I think Dr. McDonald assumes that the mouth is sufficiently widely open for the intraoral pressure to remain at atmospheric during inspiration. I find myself unable to subscribe to that view. Adenoid mouth-breathers rarely have their mouths widely open, and one has only to leave one's own lips slightly separated and perform several quiet respirations to realize that they have a valve-like action. While they exert scarcely any resistance to expiration, they undoubtedly exert a slight resistance to inspiration. To me it appears unlikely that this lip resistance could be so much less than that of the narrowed anterior nares that during inspiration a lower intranasal pressure is produced than the intraoral, especially when one remembers that the effect of any pulmonary negative pressure

in the nose is limited by the postnasal obstruction which I maintain is the most marked obstruction of the three.

However, although one's reasoning does not allow one to accept Dr. McDonald's view, I admit that there may be something in it and I am sufficiently interested to have decided to attempt to register the actual pressures in these cases.

In the third paragraph of the letter in question we are told that the anterior and posterior nasal obstructions in these cases may be so complete that "much of the air inside the nose is absorbed." I may say that I have never seen such a complete case of anterior obstruction secondary to adenoids that this is in the least bit possible. For this to happen both obstructions would have to be complete or any leak would have to be smaller than the average leak in a bicycle puncture. Oxygen is the most soluble gas in the air and oxygen injected into a knee joint or into the peritoneal cavity (for example, for assistance in X-ray diagnosis) takes a considerable time to be absorbed (hours in the case of a knee joint) and in the case of air absorption would be even slower. Also it is unlikely that nasal mucosa has a greater power of absorbing oxygen than the endothelium of joint synovia.

I trust Dr. McDonald will not look upon my criticism as being purely destructive, particularly as I was very interested in the rest of his paper.

Yours, etc.,

A. B. K. WATKINS,

M.S. (Lond.), F.R.C.S. (Eng.).

Newcastle General Hospital, New South Wales,  
May 30, 1925.

#### FRAUDULENT MEDICINE IN AUSTRALIA.

SIR: Yesterday a patient visited me to find if she had "a twisted womb" which a herbalist named X, Y or Z living at A, B or C said she was suffering from. He also informed her she would have no more children. I presume because her baby was two years old. He told her all this without any vaginal or abdominal examination and undertook to cure her with medicine only. Her sister-in-law, now *at.* about twenty-four, has and is being treated by the same man for the same complaint since she was fourteen years old, at the cost of three pounds per month! Why will they not pay us like that? Is it not time such roguery and quackery was stopped once and for all, especially now a national insurance scheme is to be started or does the Government mean to include two or three Chinese and a mongrel herbalist on the staff for consultation in Hickson cases? We have a white Australia to prevent wages and morals descending the scale, but the lives, health and pockets of the community are not worth guarding against these charlatans and rogues.

Yours, etc.,

"ANTIQUACK."

#### INFANTILE PARALYSIS AND ITS TREATMENT.

SIR: It seems to me that hardly anyone carries out the "resting" of the muscles in a sufficiently thorough manner. Too often surgeons are content to rest one muscle or set of muscles or one limb, not recognizing the widespread nature of the disease. Nearly every case that has come under my notice bears evidence of such partial treatment. When one set of muscles in a limb is grossly affected, it is more than probable that every muscle in that limb is affected to some extent. Does the corresponding limb ever escape entirely? I saw one case this week where one leg had been most carefully treated for several weeks and the other leg had developed a slight *talipes equino-cavus*. Might I urge that if a surgeon hesitates to put every muscle at rest excepting the respiratory muscles, he should at least put both legs or both arms completely at rest. The trunk muscles are very often completely overlooked and in my opinion there are few cases in which they

escape. The period of rest is also in most instances too short. Broadly speaking, months of rest rather than days would be more satisfactory.

As regards after treatment I should advise that movements should not be encouraged for at least three months; that in addition to active movements gentle massage be employed when the limb has been grossly affected to improve the circulation; that in many cases movements should be attempted with the patient in a hot bath. Many times I have been enabled to obtain an active movement by this means when other measures have failed.

As regards position for rest, I agree with Ellis that rest for a joint is midway between its extremes of movement. Batten's angle of 0° advocated by Mackenzie, is absolutely harmful in my opinion.

Several people lay claim to the method of active movement. Following Dr. Roth I have always for the past thirty-five years insisted that an ounce of active movement is worth a ton of passive.

The after care or want of it is a standing reproach. Cannot some outside voluntary means be brought into being to look after these cases? Mothers get tired of bringing their children day after day to the hospital for massage and seeing but little improvement, cease to attend. The large amount of time required to elicit the proper active movements makes it impossible for those diligent masseuses, who give so much of their time and energy to hospitals, to carry out this treatment properly. In the City of Melbourne we hope to institute a band of voluntary workers who will be trained in this method.

There seems hardly any fixed period when some restitution of power is impossible especially in muscles like the *gastrocnemius* and *soleus*. I used to look upon *talipes calcaneus paralyticus* as the most hopeless form in which to expect improvement, but of late years, by putting the foot in plantar flexion in plaster and changing every fortnight or so, increasing the flexion if possible, I have had quite a number of successes.

In one case lately of gross *talipes equino-cavus* thirty years after the onset, contraction of the anterior leg muscles was elicited within three weeks of restitution of the deformity.

Yours, etc.,

W. KENT HUGHES,

Consulting Surgeon,

Children's Hospital, Melbourne.

22, Collins Street,  
Melbourne (undated).

#### Obituary.

JOHN BRADY NASH.

WE regret to announce the death of Dr. John Brady Nash, which occurred at Sydney on June 4, 1925.

#### Post-Graduate Work.

##### OBSTETRICAL COURSE IN MELBOURNE.

THE attention of members is directed to the arrangements which are being made in connexion with the post-graduate course in obstetrics about to be held in Melbourne under the auspices of the Melbourne Permanent Committee for Post-Graduate Work. The course will take place in the last fortnight in June. The board of the Women's Hospital have agreed to permit practitioners attending the course to go into residence at the hospital in order that they may follow the work in the hospital very closely. There are still a few vacancies. Members are urged not to allow this favourable opportunity to slip. There will be no medical students in residence during the period and in consequence the value of this short stay in the hospital will be immeasurable. Applications should be made to Dr. J. W. Dunbar Hooper or Dr. Harold Dew, the Honorary Secretaries of the Committee, at 12, Collins Street, Melbourne.

## BIRTHDAY HONOURS.

ON the occasion of his birthday His Majesty the King has created Sir John Bland-Sutton a baronet. The medical profession in Australia is greatly gratified that this distinguished English surgeon should have received this further distinction. Sir John's prowess as a leader in British surgery and his work in human and comparative morphology have earned for him a high rank in the profession. We tender to him our hearty congratulations.

## THE WILLIAM MACEWEN MEMORIAL FUND.

WE have to acknowledge the receipt of a subscription of ten guineas from Dr. Gavin McCallum, of 127, Collins Street, Melbourne, "as a token of affection and respect from an old student and house surgeon." No doubt other former students of William Macewen will follow this lead. Contributions will be acknowledged in these columns.

## LIST OF MEMBERS.

## Corrigendum.

In the list of members of the Victorian Branch of the British Medical Association published as a supplement to THE MEDICAL JOURNAL OF AUSTRALIA, of April 25, 1925, the crossed swords indicating war service were omitted in connexion with the name of Dr. R. R. Wettenhall, 85, Spring Street, Melbourne.

## Books Received.

A TEXTBOOK OF PATHOLOGY, GENERAL AND SPECIAL: FOR THE USE OF STUDENTS AND PRACTITIONERS, by J. Martin Beattie, M.A. (N.Z.), M.D. (Edin.), M.R.C.S., L.R.C.P. (Lond.), and W. E. Carnegie Dickson, M.D., B.Sc., F.R.C.P. (Edin.). Third Edition. 1925. London: William Heinemann (Medical Books) Limited. Royal 8vo., pp. xvii. + 1,102 with 499 illustrations in the text and 17 coloured plates from original preparations. Price: 42s. net.

CLINICAL FEATURES OF HEART DISEASE: AN INTERPRETATION OF THE MECHANISMS OF DIAGNOSIS FOR PRACTITIONERS, by Leroy Crummer, M.D., Introduction by Emanuel Libman, M.D.; 1925. New York: Paul B. Hoeber, Incorporated. Post 8vo., pp. xix. + 353. Price: \$3.00.

HEALTH AND PSYCHOLOGY OF THE CHILD, Edited by Elizabeth Sloan Chesser, M.D., Foreword by Sir Maurice Craig, C.B.E., M.D., F.R.C.P.; 1925. London: William Heinemann (Medical Books) Limited. Crown 8vo., pp. vi. + 150. Price: 7s. 6d.

JOURNAL AND PROCEEDINGS OF THE ROYAL SOCIETY OF NEW SOUTH WALES FOR 1924, Edited by the Honorary Secretaries. Volume LVIII; 1925. Sydney: Published by the Society, 5, Elizabeth Street, Sydney. Demy 8vo., pp. xxiv. + 340.

MEDICAL AND SURGICAL REPORT OF THE ROOSEVELT HOSPITAL, NEW YORK, Editorial Board: Alexander T. Martin, M.D., Thomas C. Peightal, M.D., Alfred Stillman, M.D., Henry C. Thatcher, M.D., Davenport West, M.D., Kirby Dwight, M.D., Second Series, Based on the Work of the Years 1915-1924 Inclusive; 1925. New York: Paul B. Hoeber, Incorporated. Royal 8vo., pp. xvi. + 378. Price: \$5.00.

MINOR SURGERY, by Lionel R. Fifield, F.R.C.S. (Eng.). 1925. London: H. K. Lewis & Company Limited. Crown 8vo., pp. ix. + 431. Price: 12s. 6d. net.

## Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xvi.

AUSTIN HOSPITAL, HEIDELBERG, VICTORIA: Honorary Physician.

WESTERN AUSTRALIAN PUBLIC SERVICE: Medical Officer of Schools.

## Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C..

| BRANCH.   | APPOINTMENTS.  |
|---|--|
| NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.     | Australian Natives' Association.<br>Ashfield and District Friendly Societies' Dispensary.<br>Balmmain United Friendly Societies' Dispensary.<br>Friendly Society Lodges at Casino.<br>Leichhardt and Petersham Dispensary.<br>Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney.<br>Marriekville United Friendly Societies' Dispensary.<br>North Sydney United Friendly Societies' People's Prudential Benefit Society.<br>Phoenix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.        | All Institutes or Medical Dispensaries<br>Australian Prudential Association<br>Proprietary, Limited.<br>Mutual National Provident Club.<br>National Provident Association.   |
| QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane. | Brisbane United Friendly Society<br>Institute.<br>Stannary Hills Hospital.   |
| SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide.          | Contract Practice Appointments at Renmark.<br>Contract Practice Appointments in South Australia.   |
| WESTERN AUSTRALIAN: Honorary Secretary, Saint George's Terrace, Perth.      | All Contract Practice Appointments in Western Australia.   |
| NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.          | Friendly Society Lodges, Wellington, New Zealand.  |

## Diary for the Month.

- JUNE 16.—Tasmanian Branch, B.M.A.: Council.  
JUNE 16.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
JUNE 17.—Western Australian Branch, B.M.A.: Branch.  
JUNE 17.—South Sydney Medical Association, New South Wales.  
JUNE 18.—Section of Paediatrics, New South Wales Branch, B.M.A.  
JUNE 23.—New South Wales Branch, B.M.A.: Medical Politics Committee: Organization and Science Committee.  
JUNE 24.—Victorian Branch, B.M.A.: Council.  
JUNE 25.—New South Wales Branch, B.M.A.: Branch.  
JUNE 25.—South Australian Branch, B.M.A.: Branch.  
JUNE 26.—Queensland Branch, B.M.A.: Council.  
JUNE 27.—Eastern District Medical Association, New South Wales.  
JULY 1.—Victorian Branch, B.M.A.: Branch.  
JULY 3.—Queensland Branch, B.M.A.: Branch.  
JULY 7.—New South Wales Branch, B.M.A.: Council (Quarterly).  
JULY 7.—Tasmanian Branch, B.M.A.: Council.  
JULY 9.—Victorian Branch, B.M.A.: Council.  
JULY 9.—South Australian Branch, B.M.A.: Council.  
JULY 9.—New South Wales Branch, B.M.A.: Clinical Meeting.

## Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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